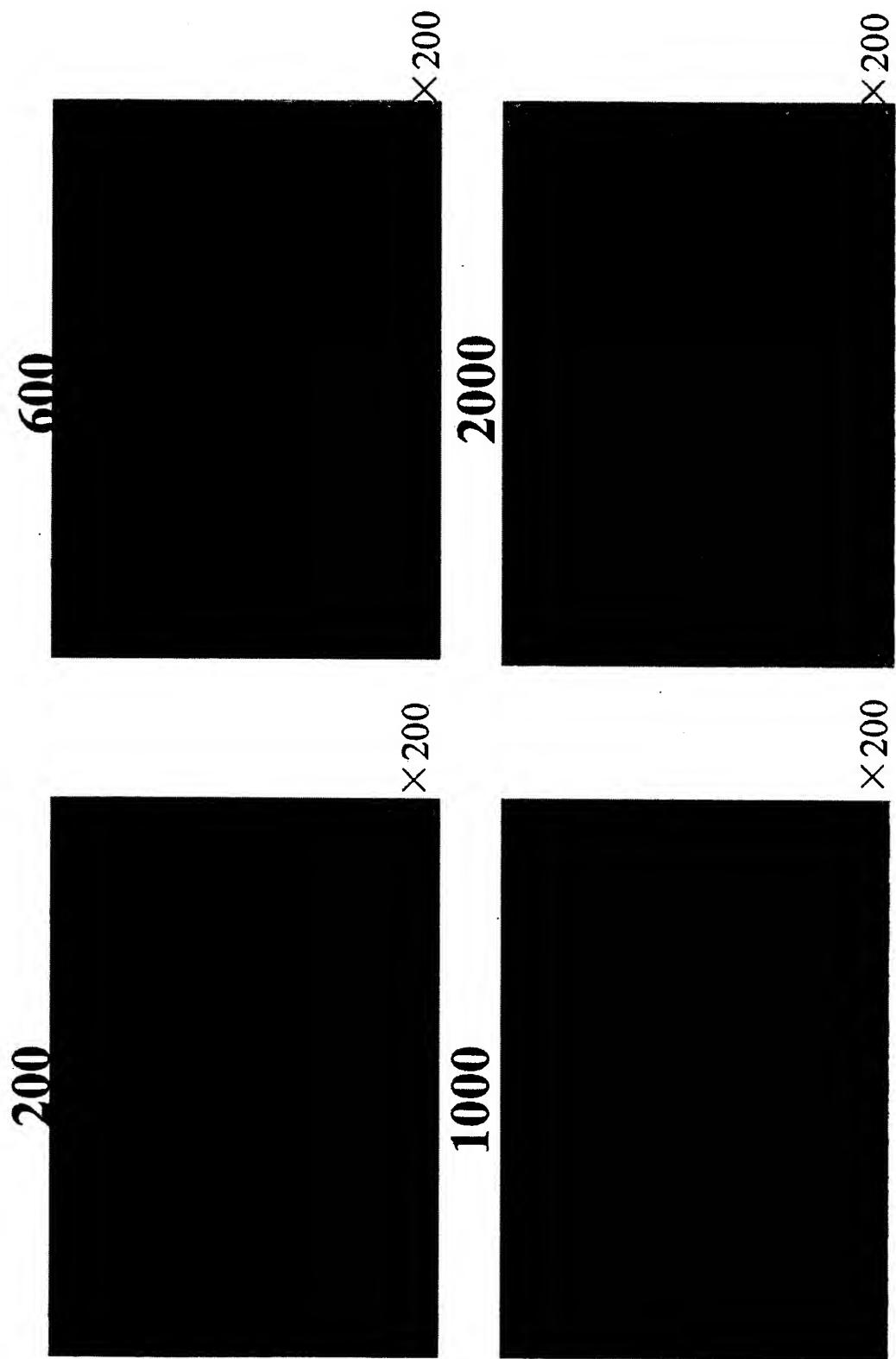


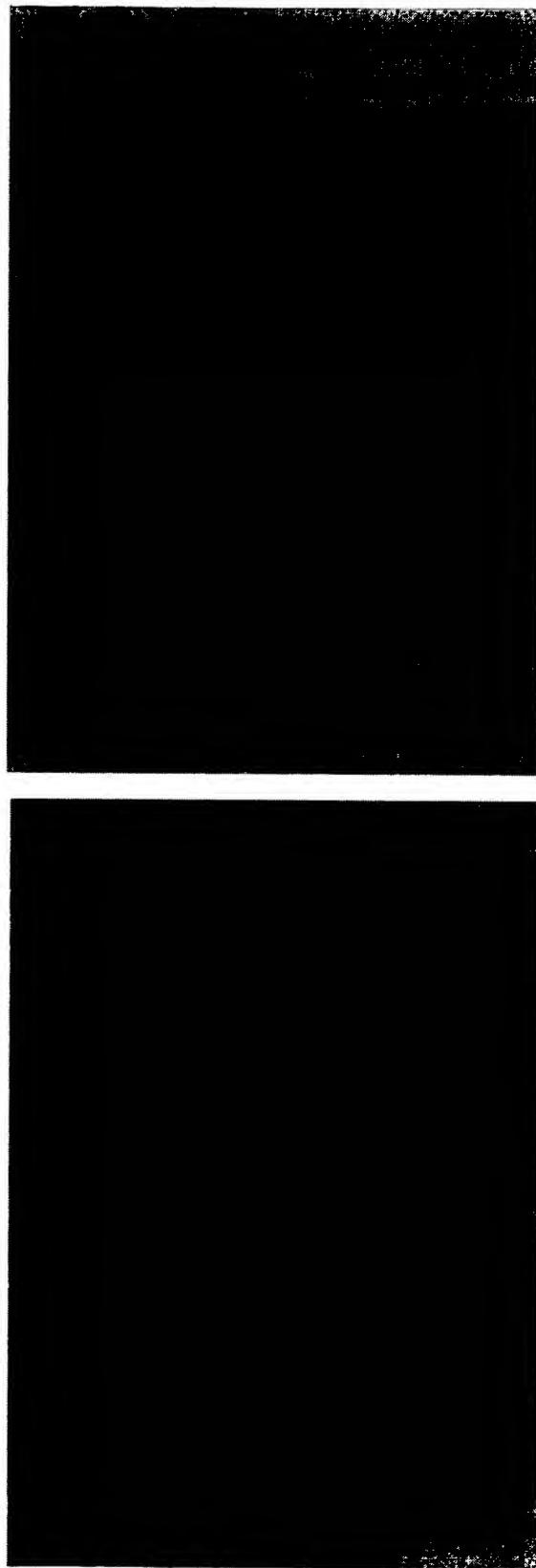
Fig. 1



BEST AVAILABLE COPY

Fig. 2

PEG1000



Without agitation $\times 200$

With agitation $\times 200$

BEST AVAILABLE COPY

Fig. 3

×40



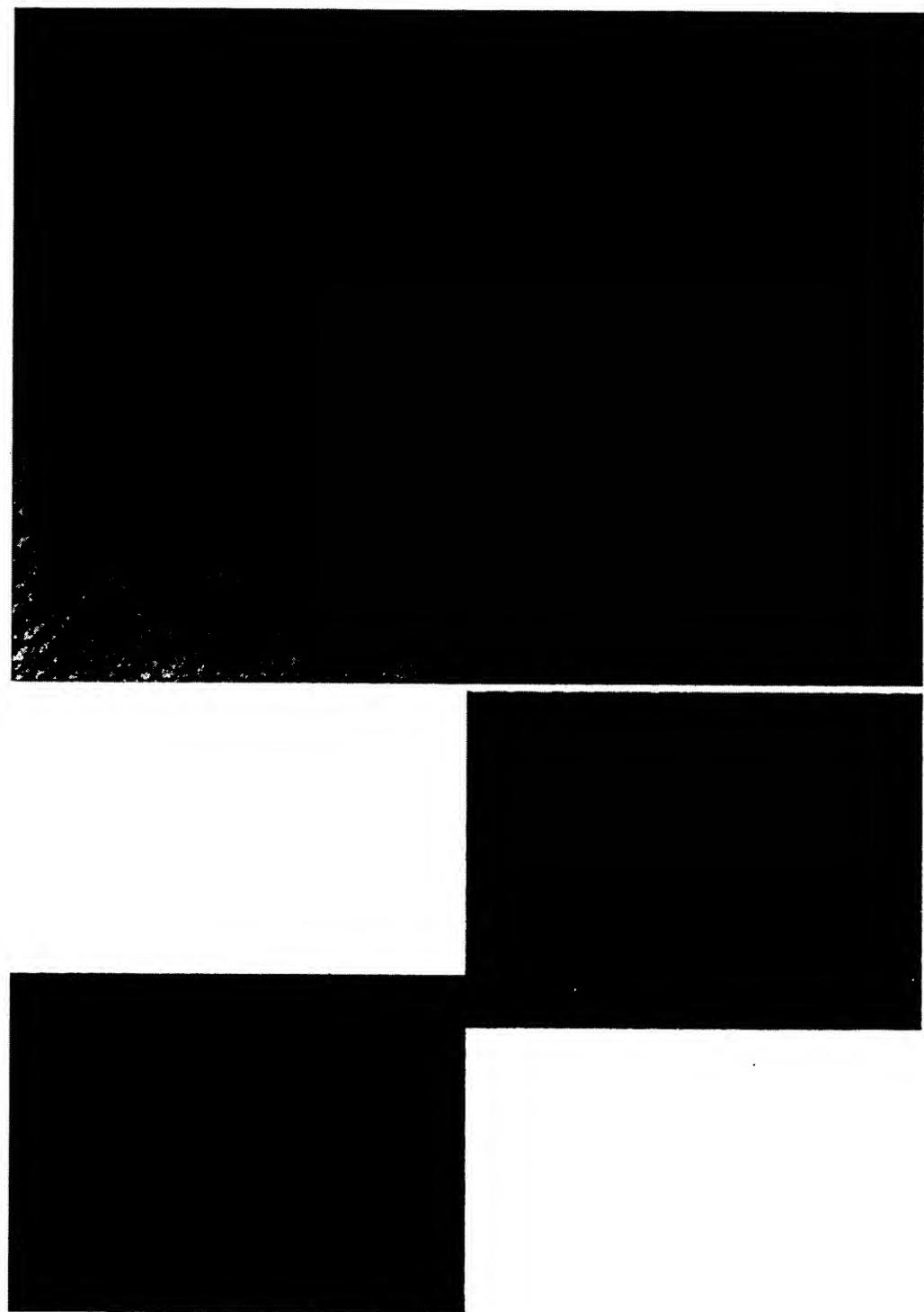
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Fig. 4



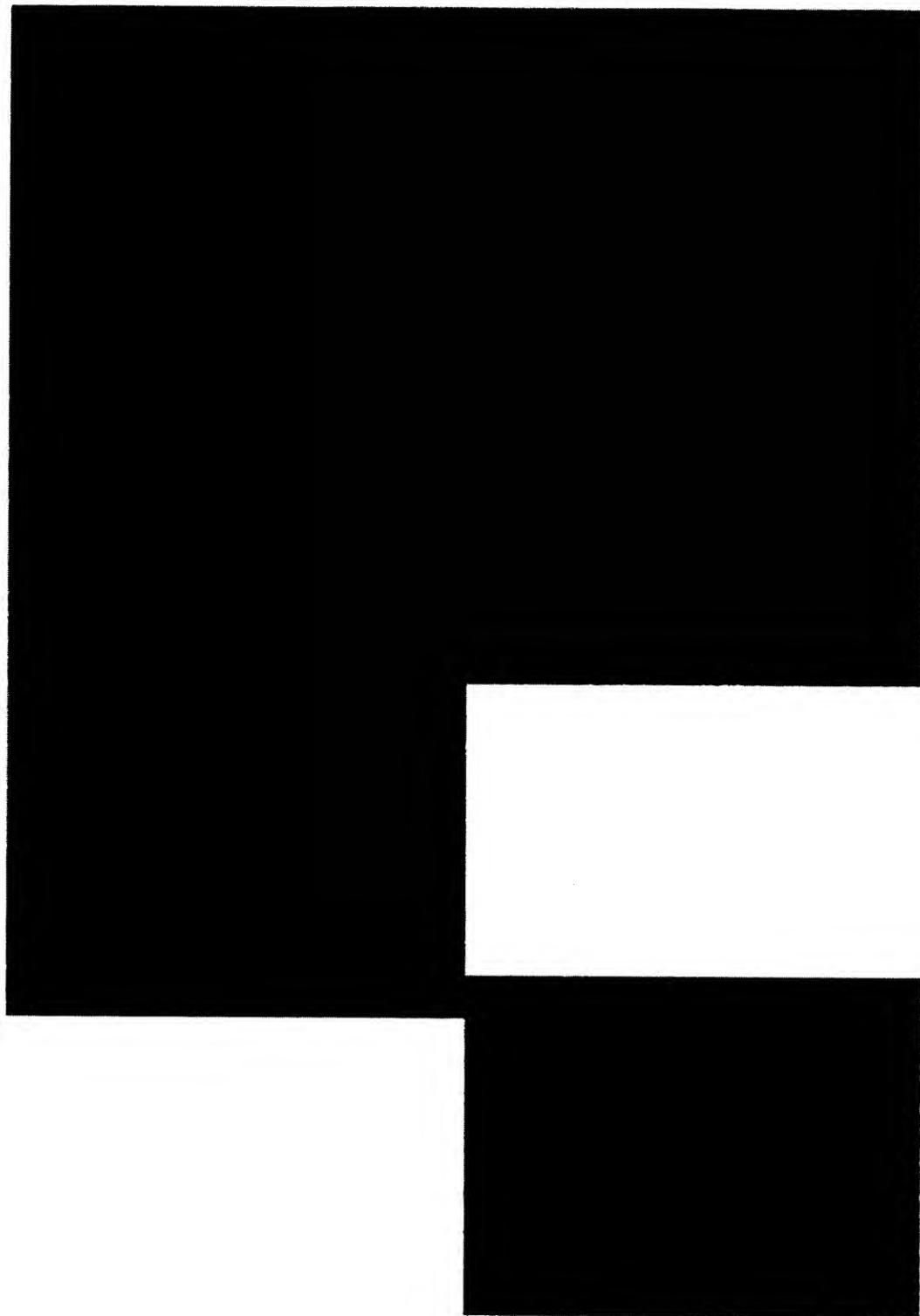
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Fig. 5



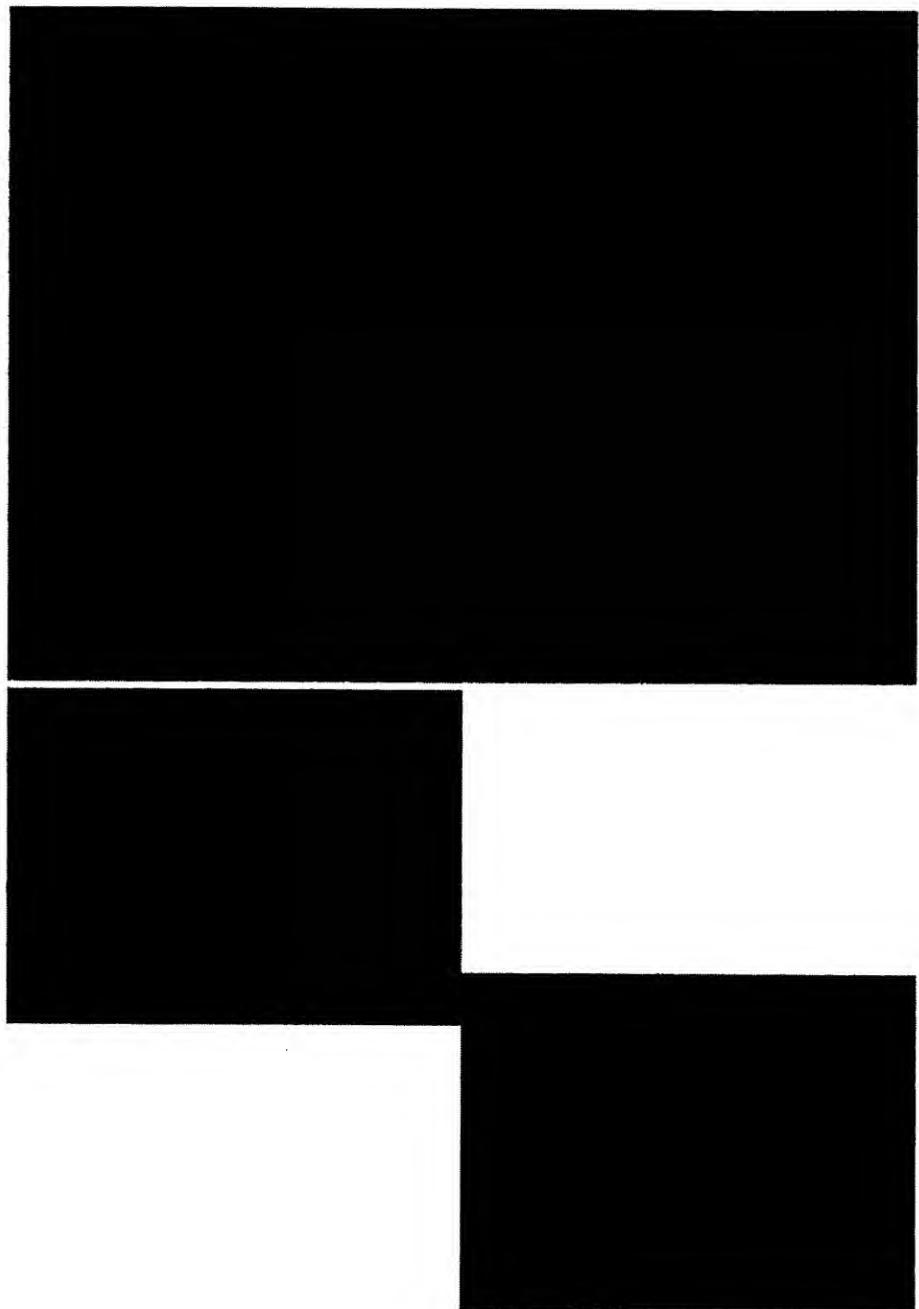
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Fig. 6



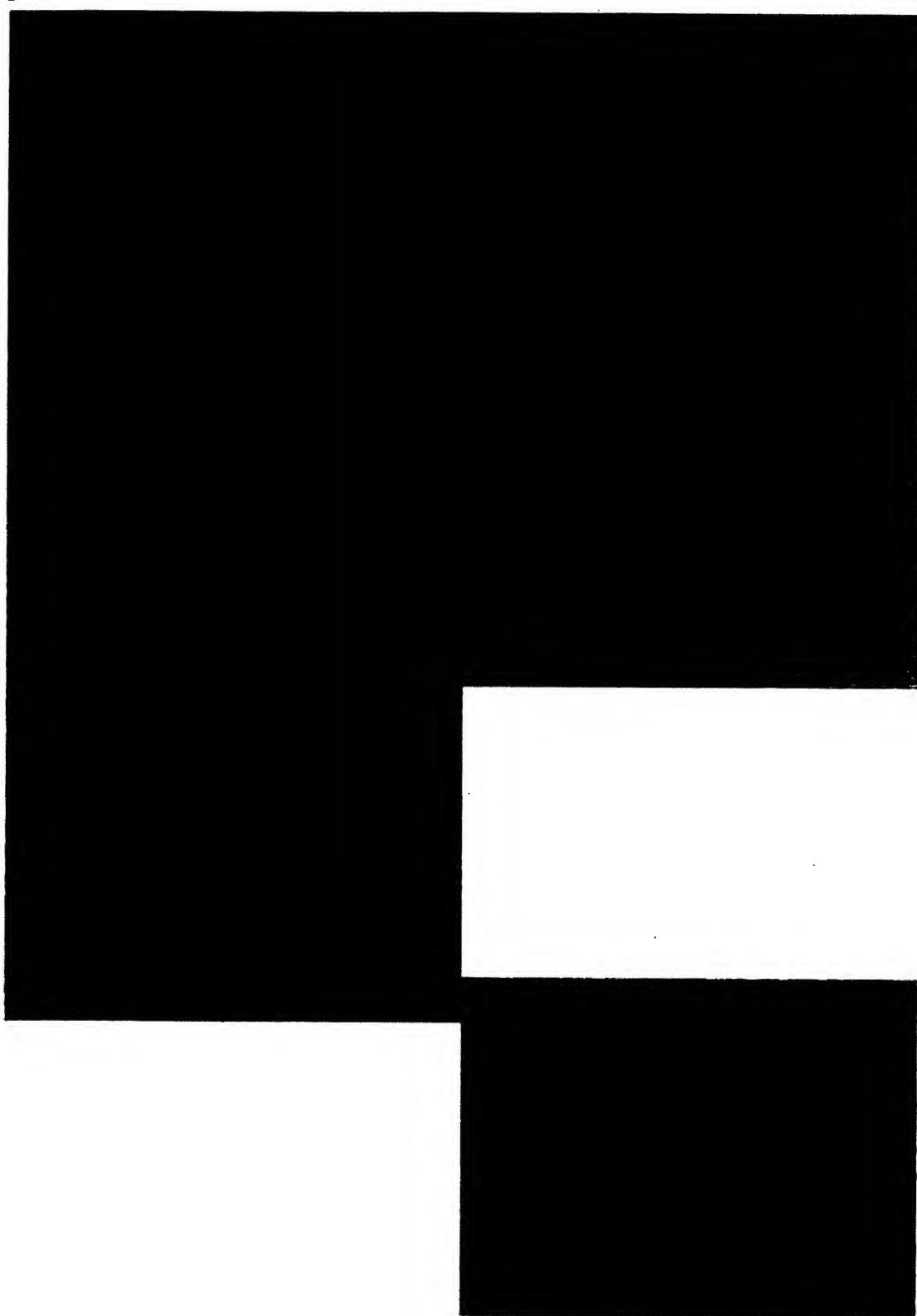
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Fig. 7



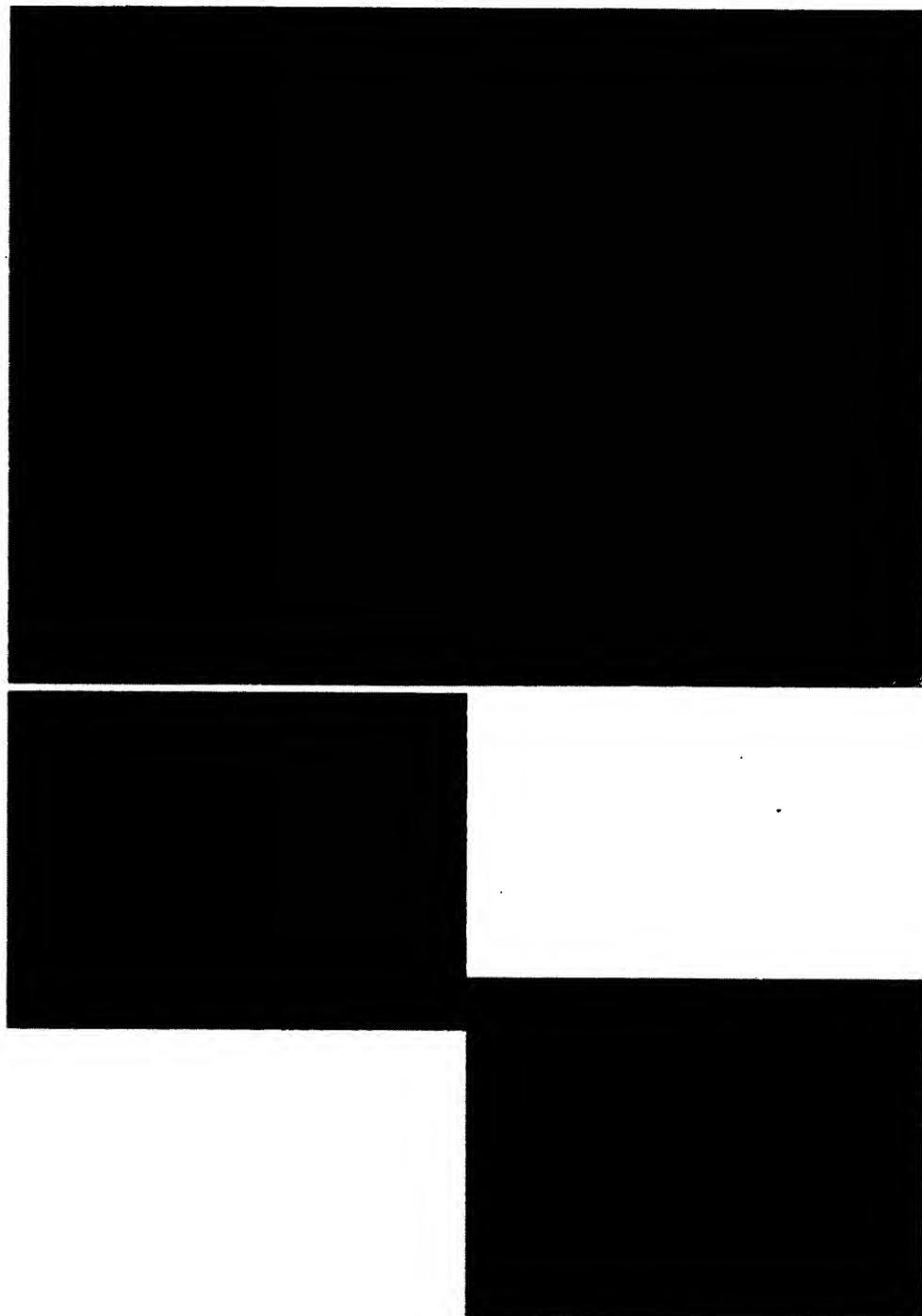
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Fig. 8



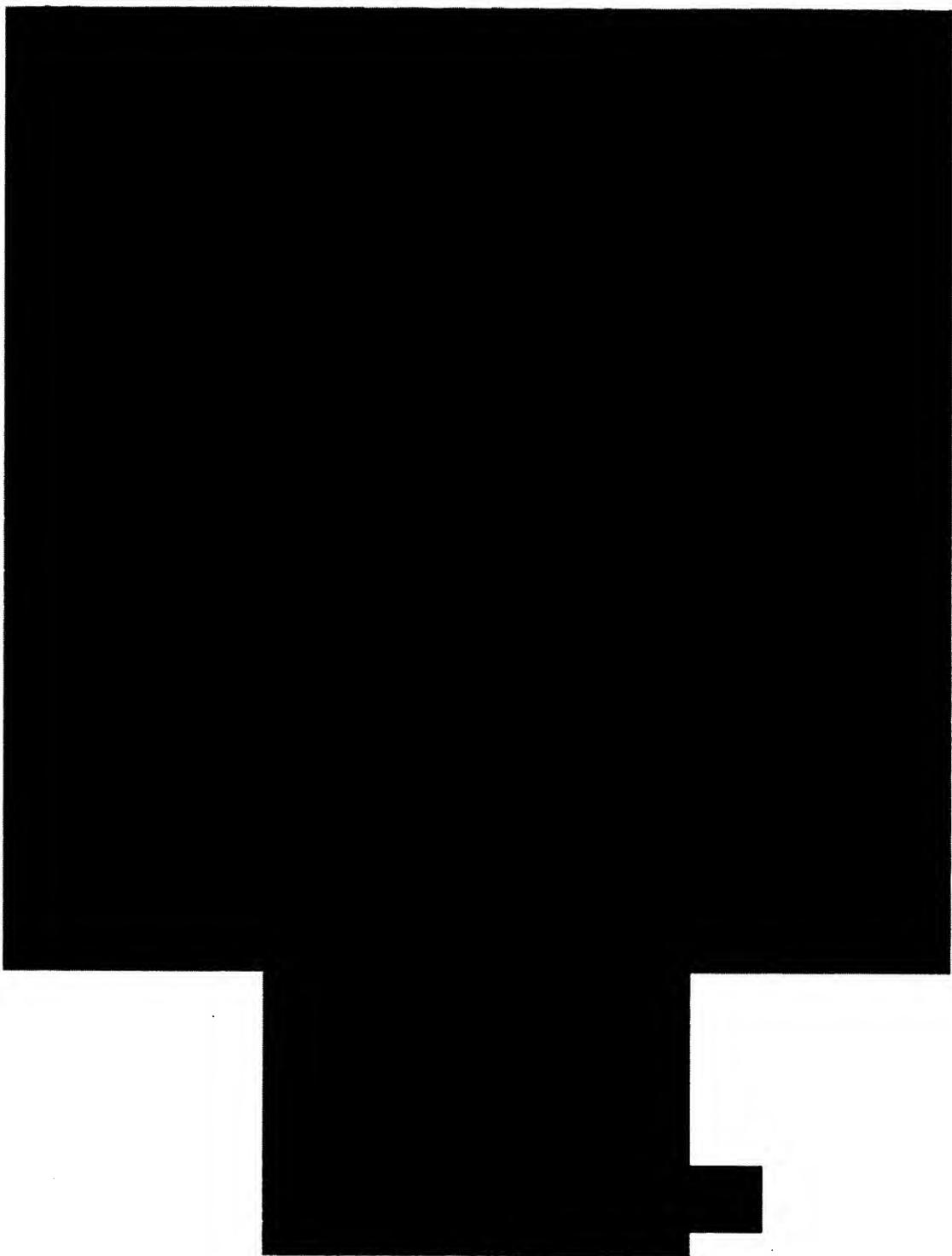
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Fig. 9



BEST AVAILABLE COPY

Fig. 10



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Fig. 11

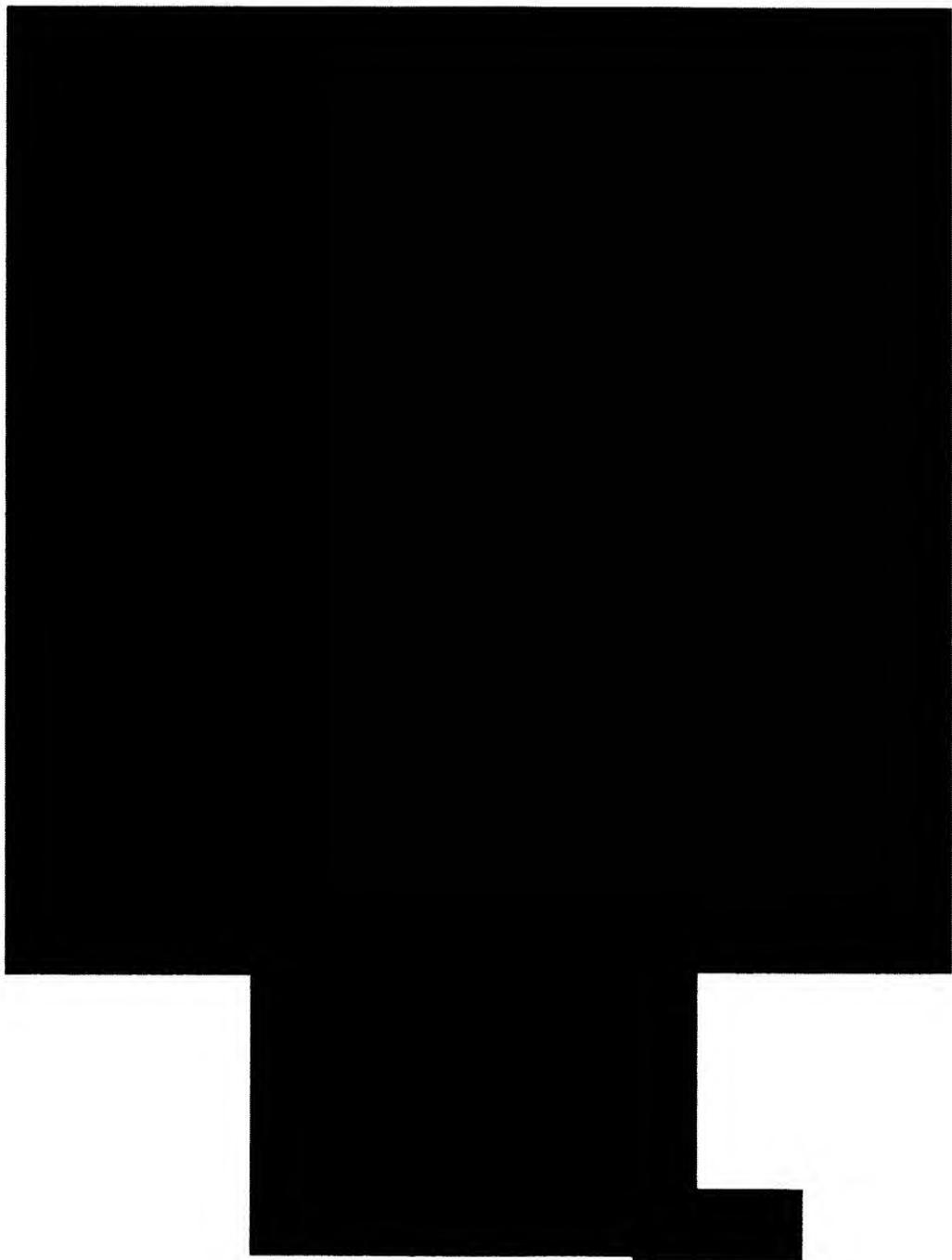


Fig. 12

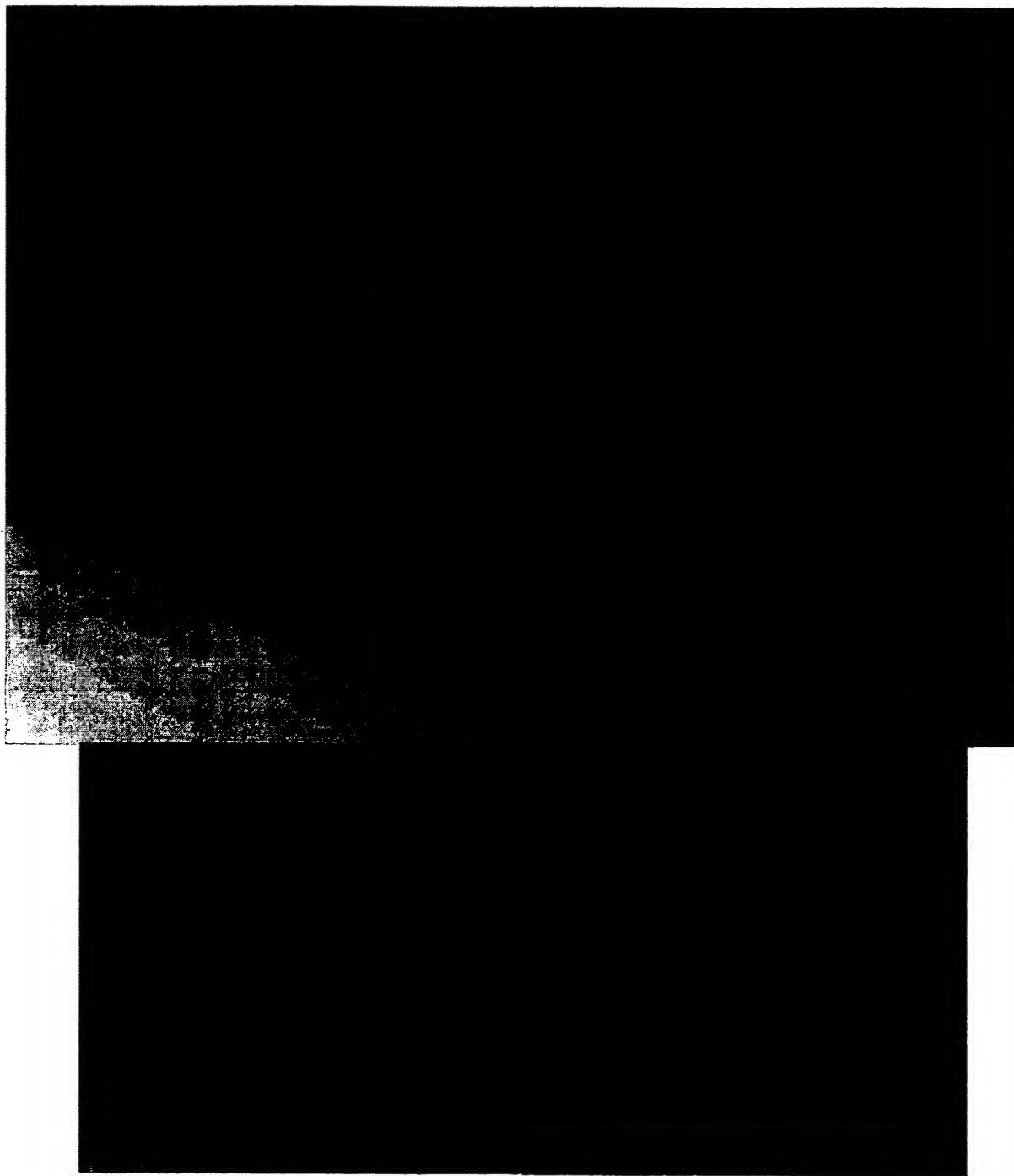


Fig. 13

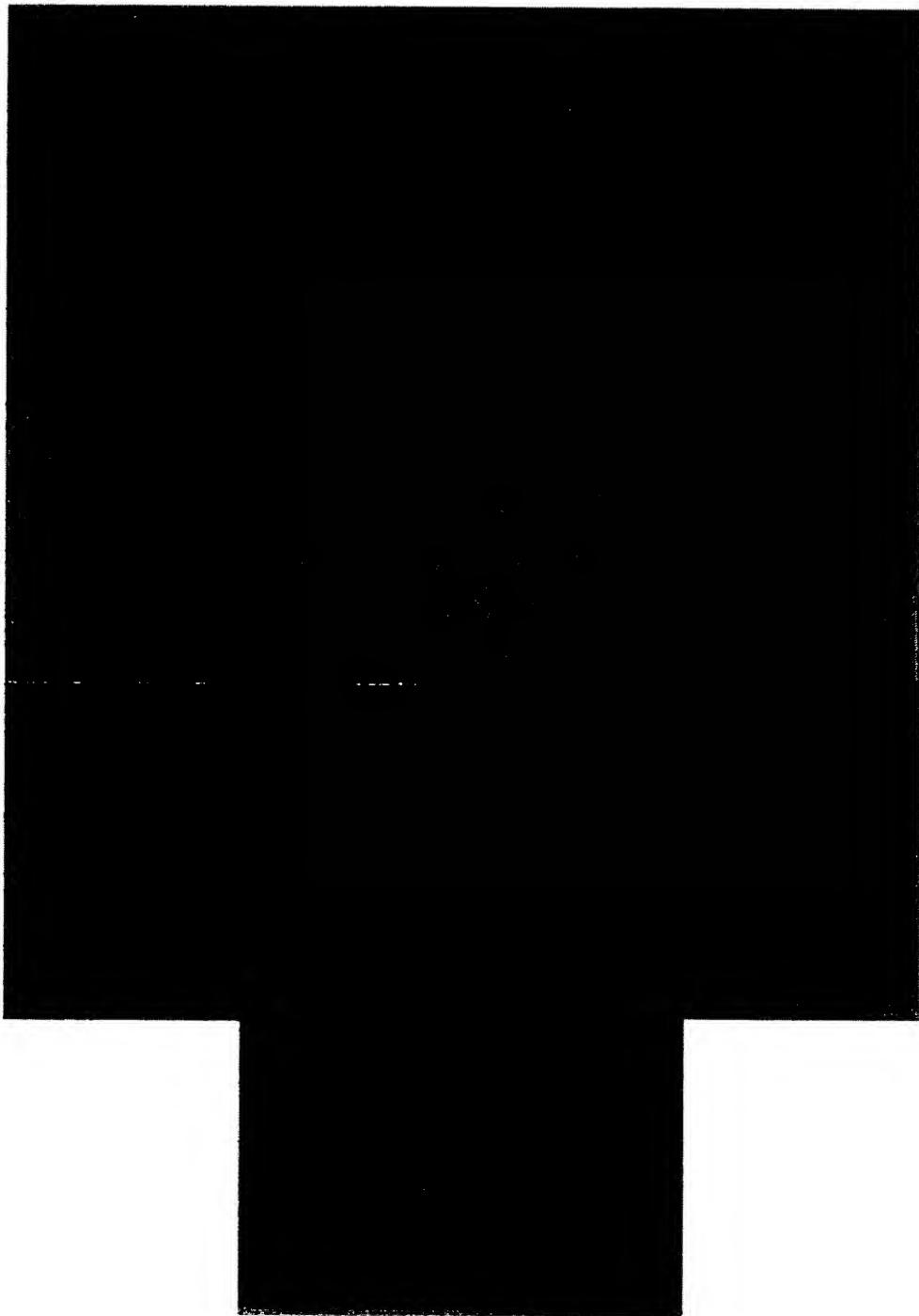


Fig. 14

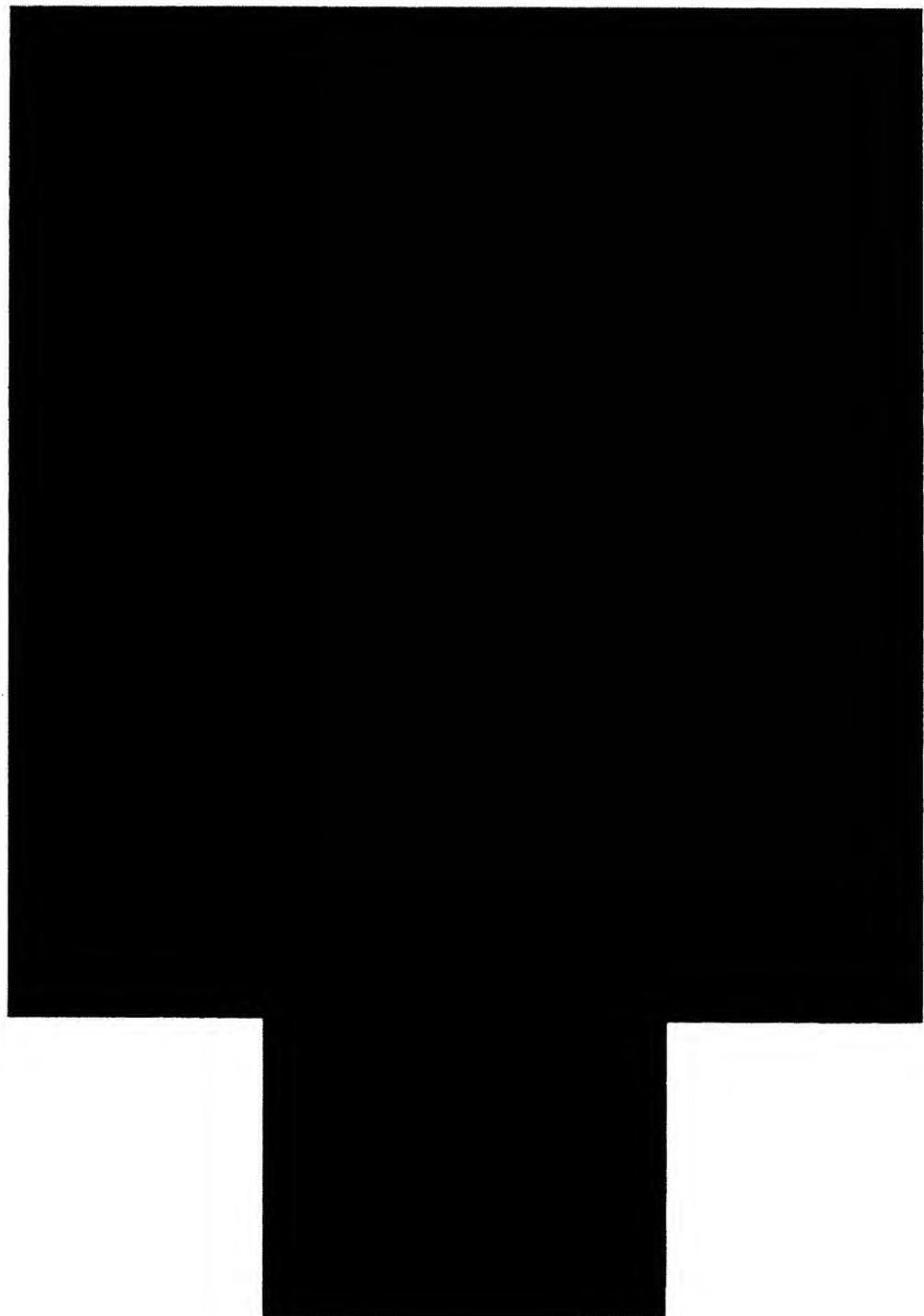


Fig. 15

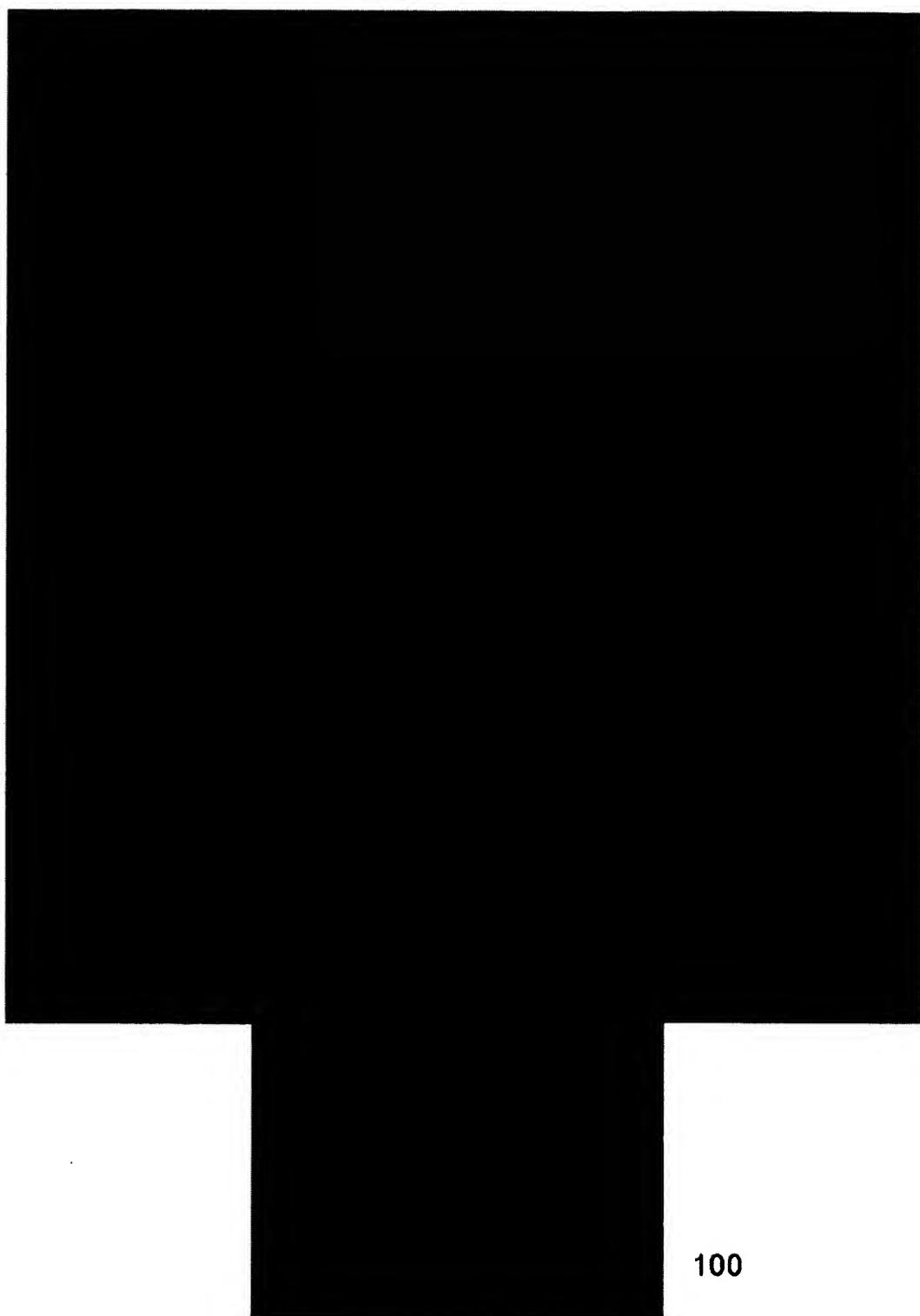


Fig. 16

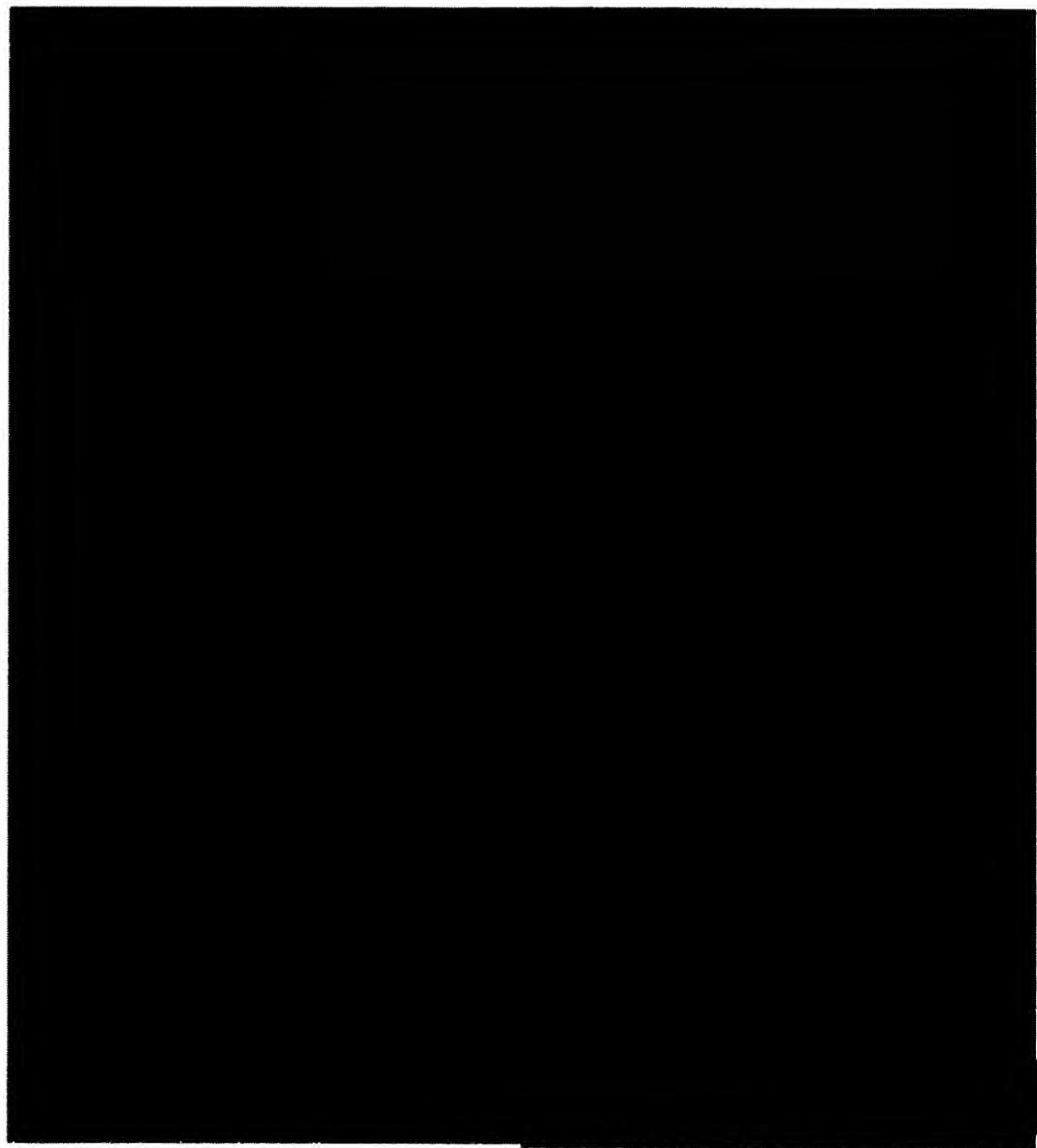


Fig. 17

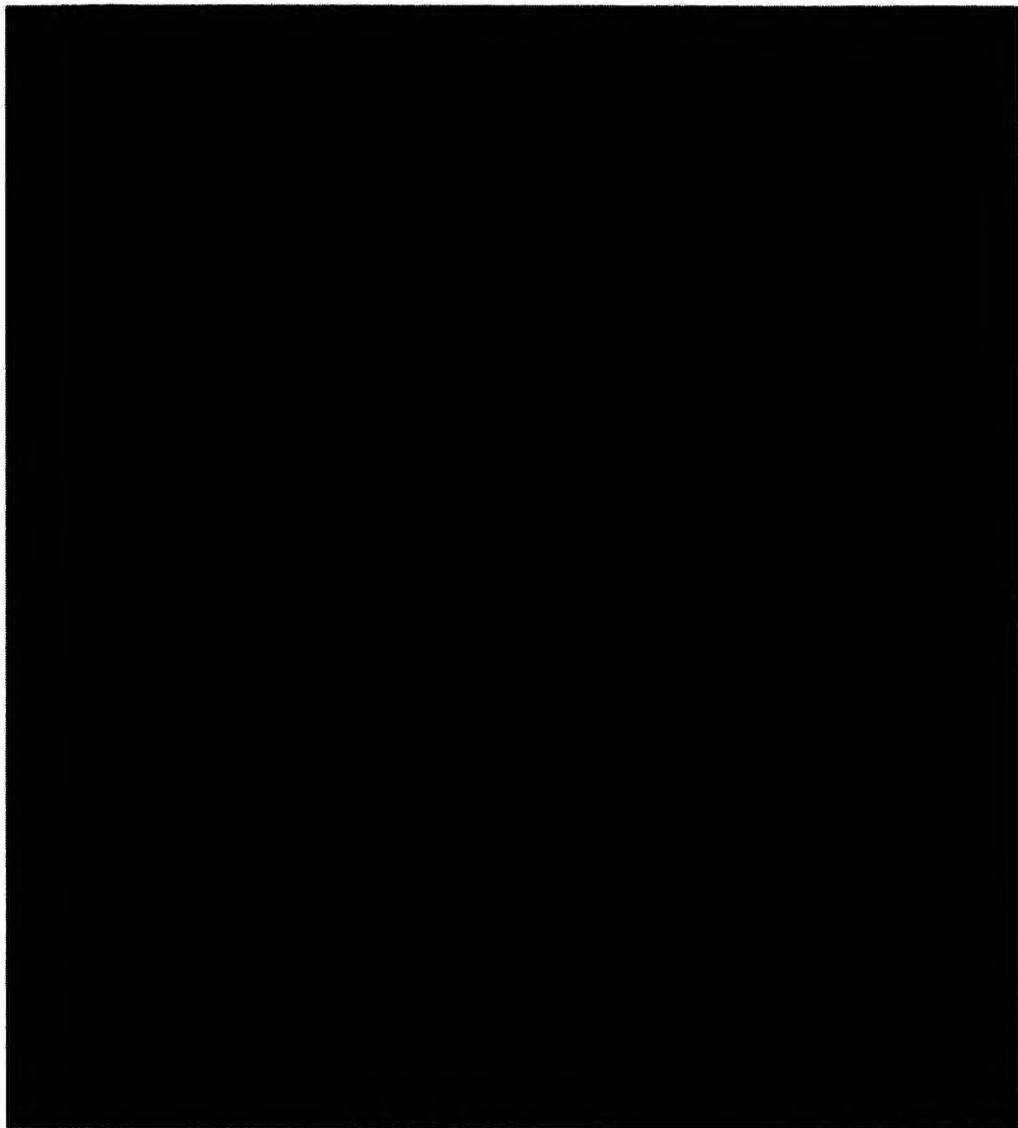


Fig. 18

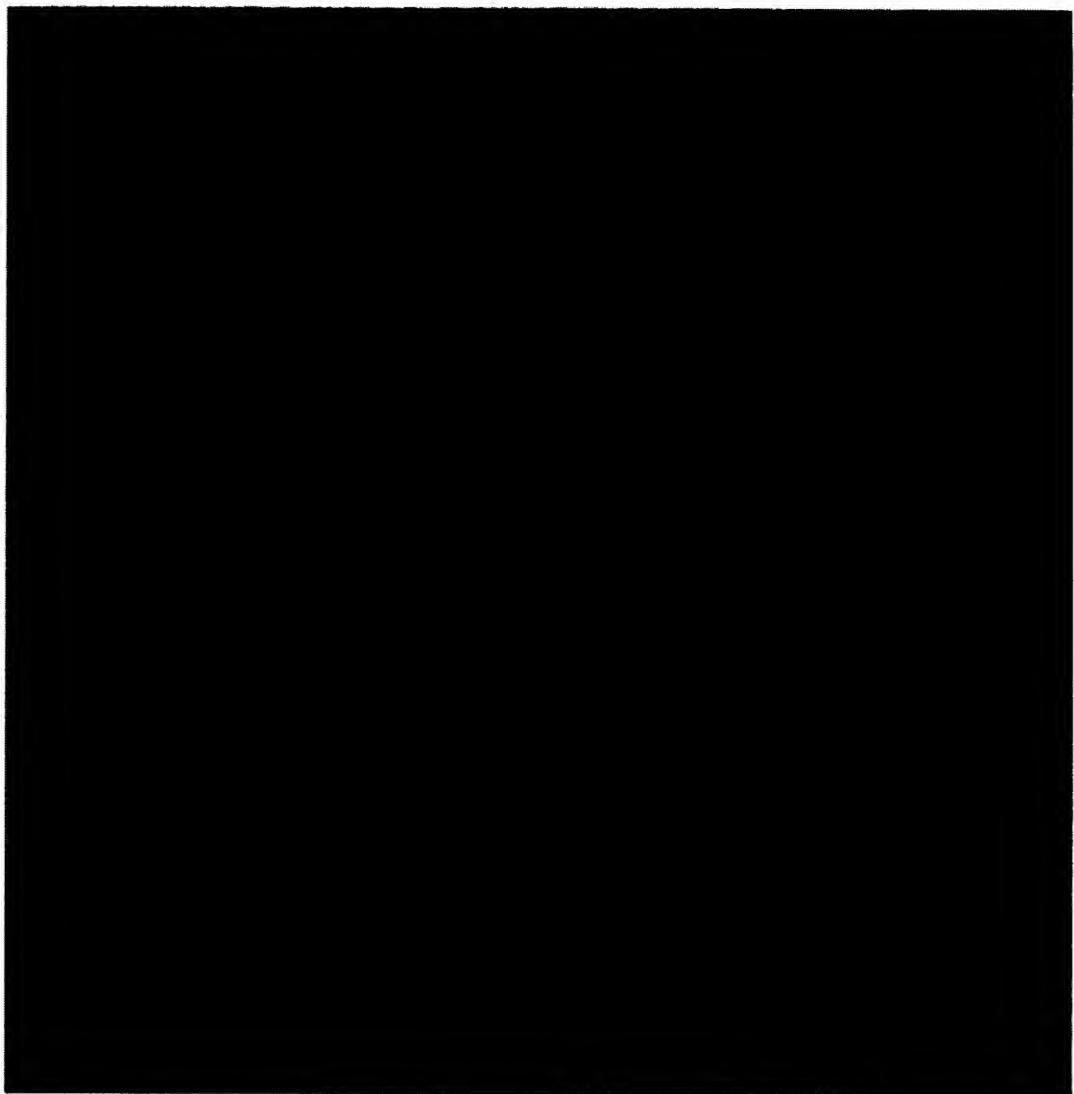


Fig. 19

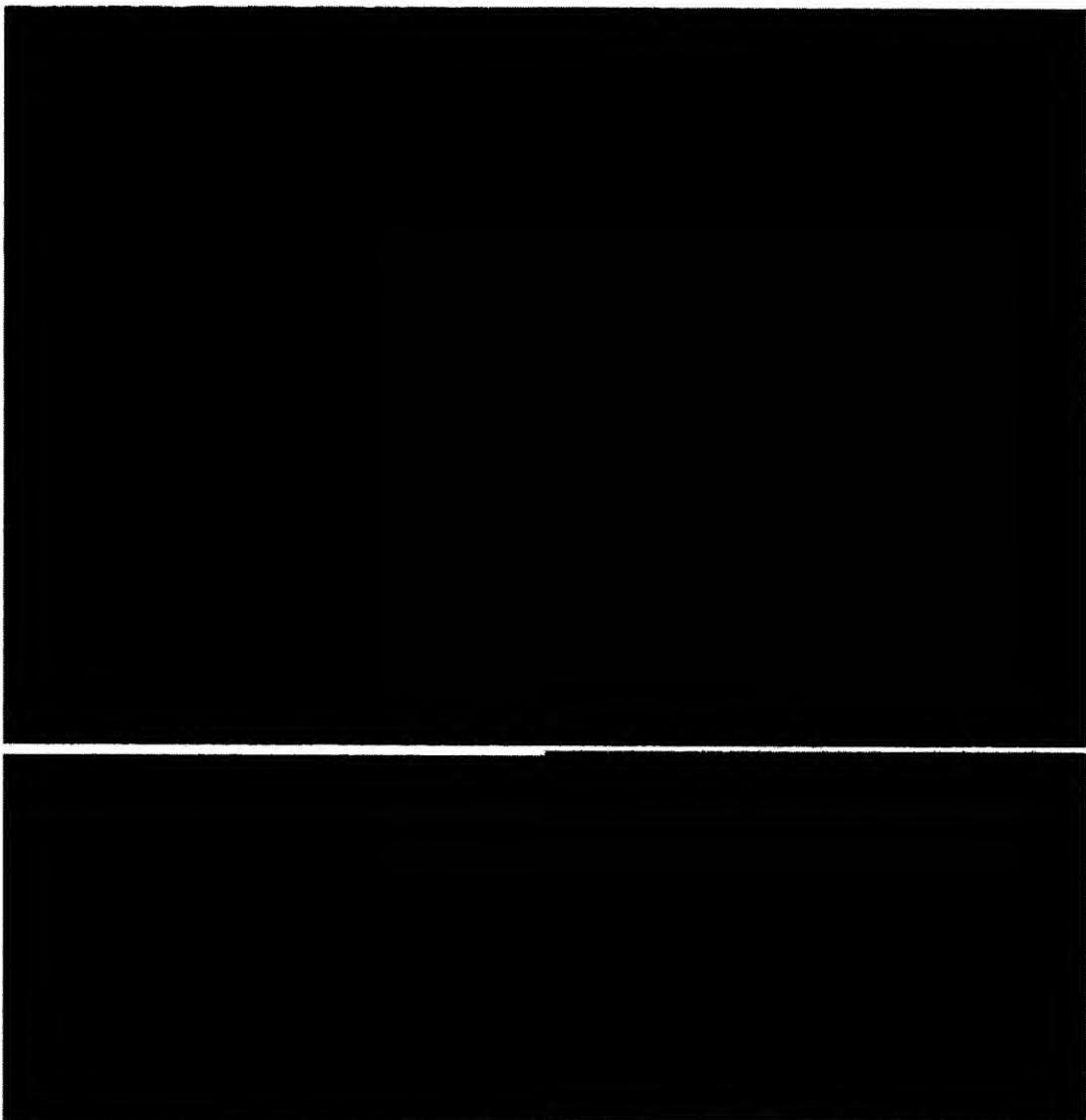


Fig. 20



Fig. 21

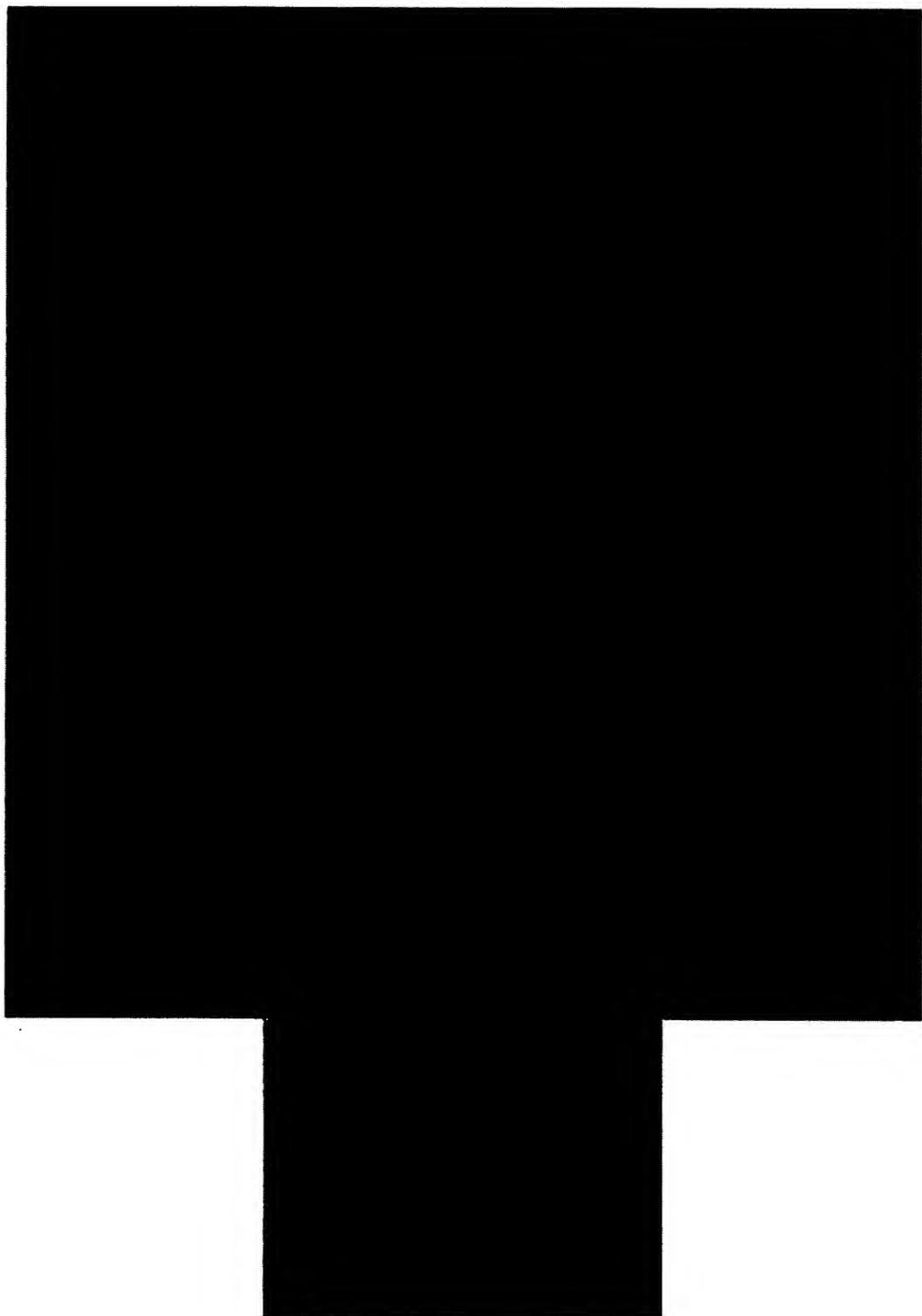


Fig. 22

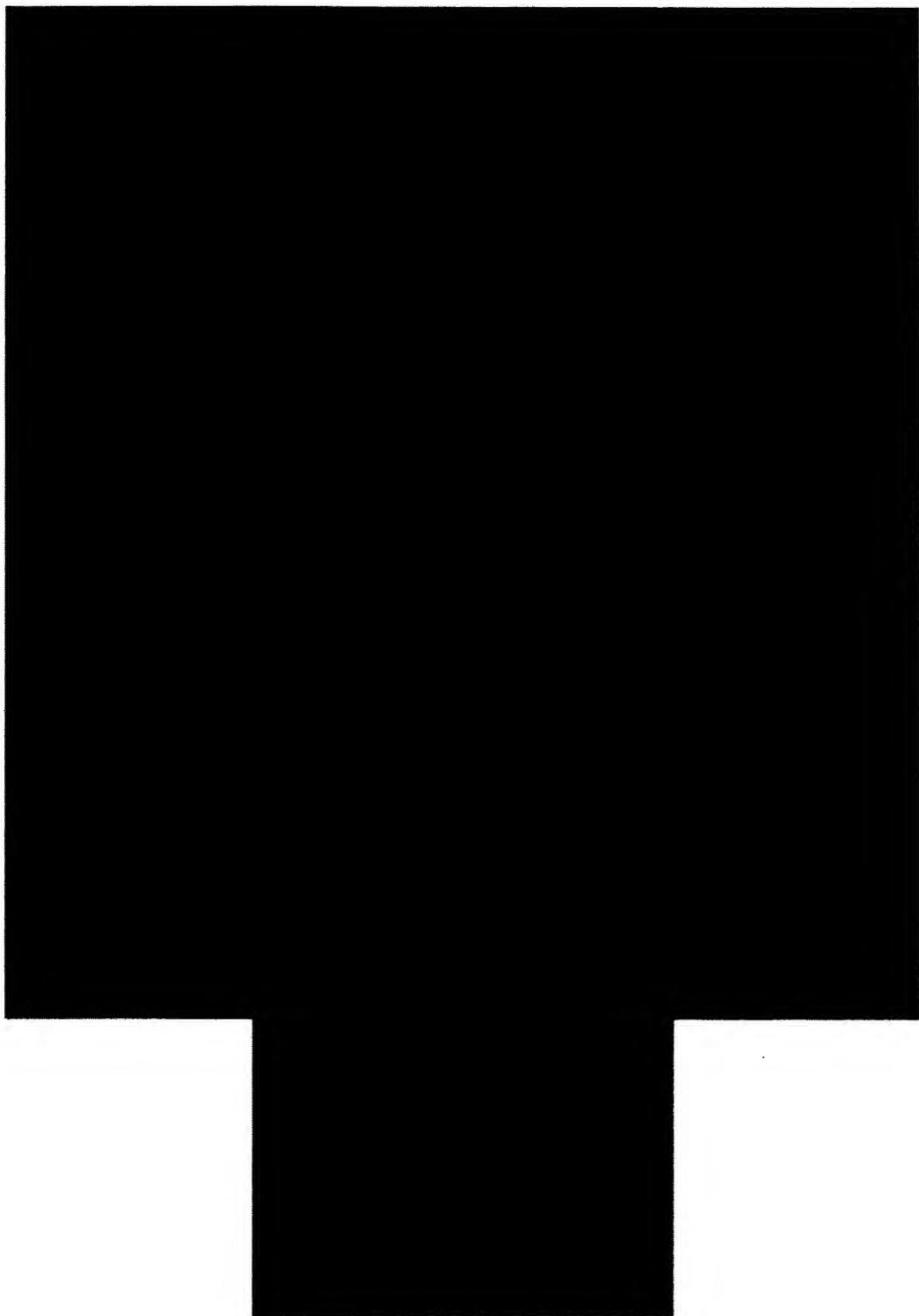


Fig. 23

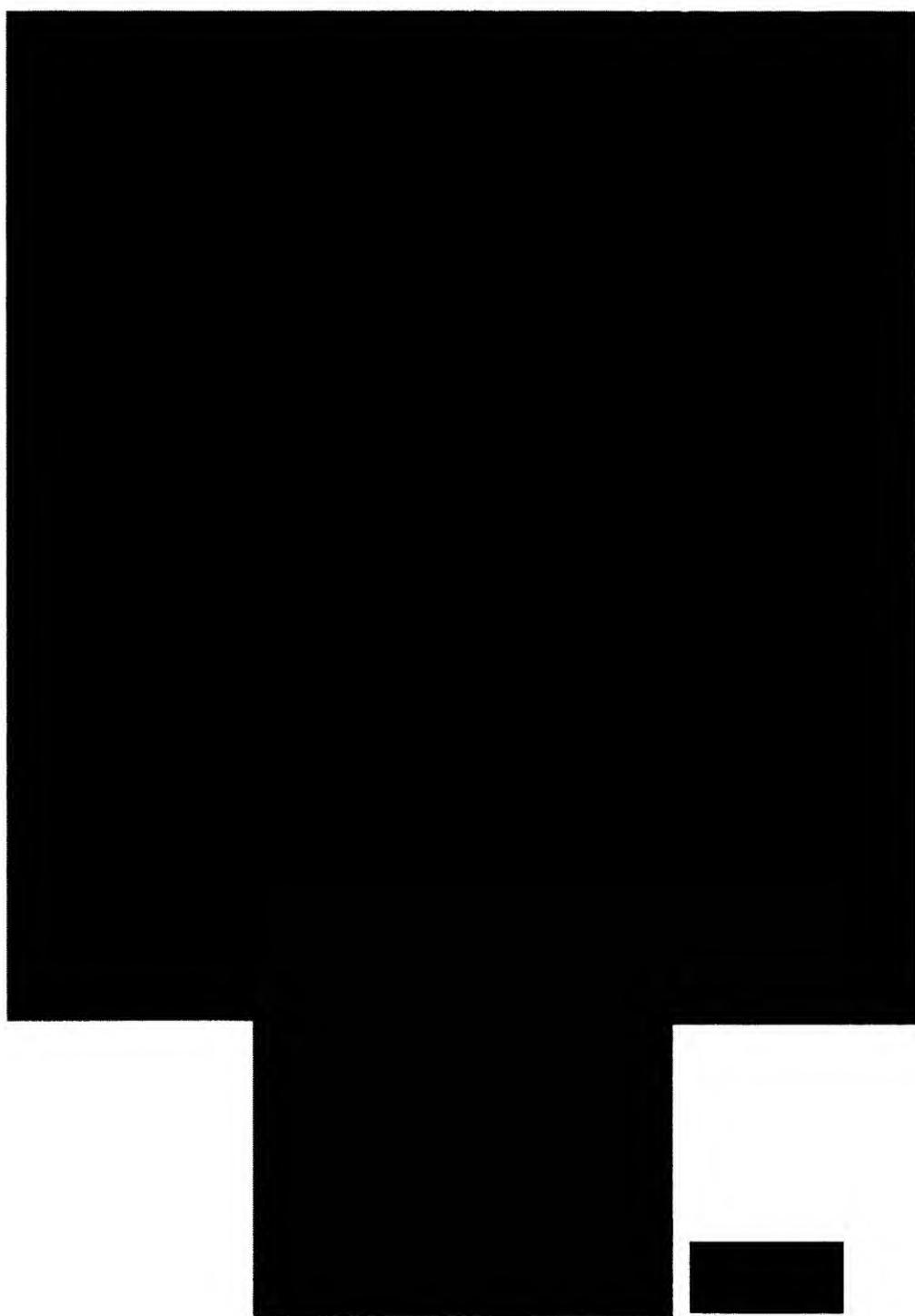


Fig. 24

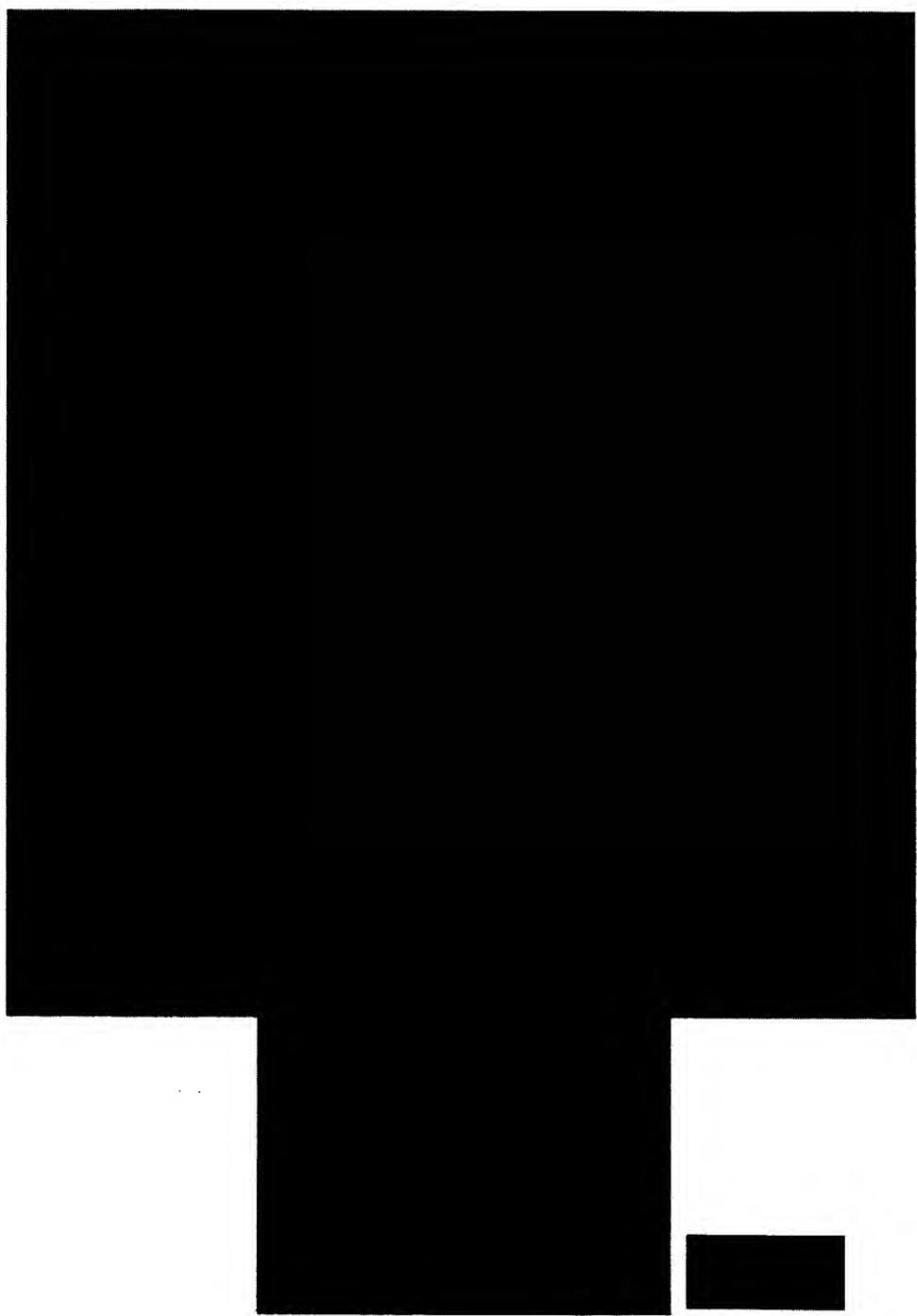


Fig. 25

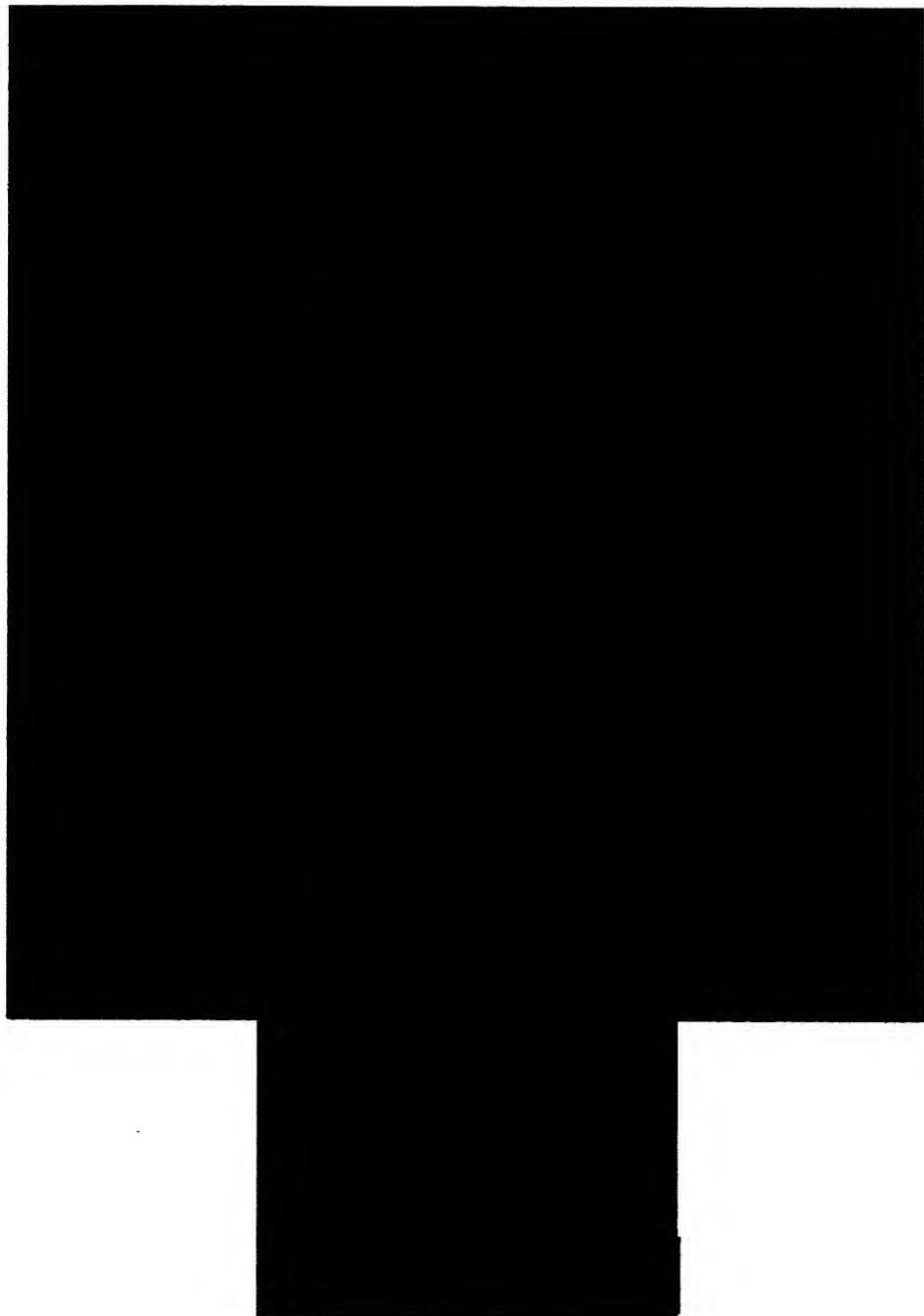
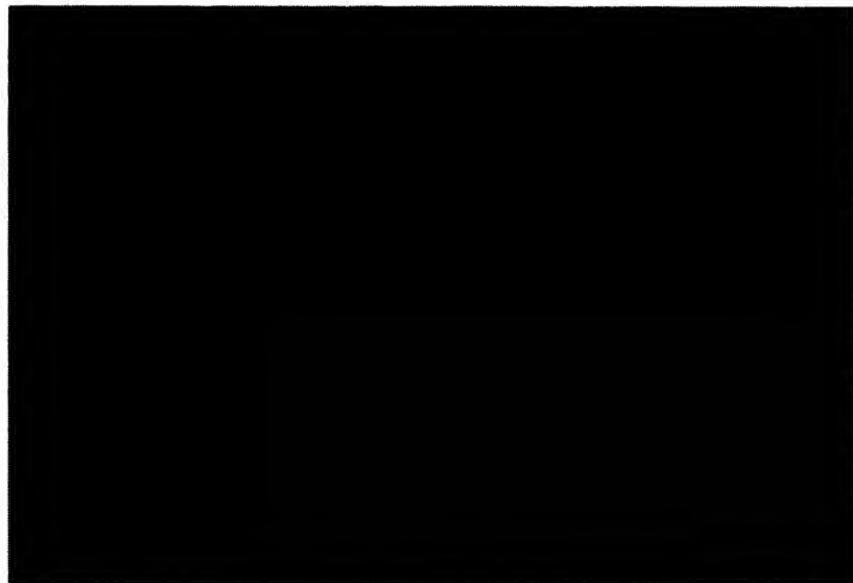
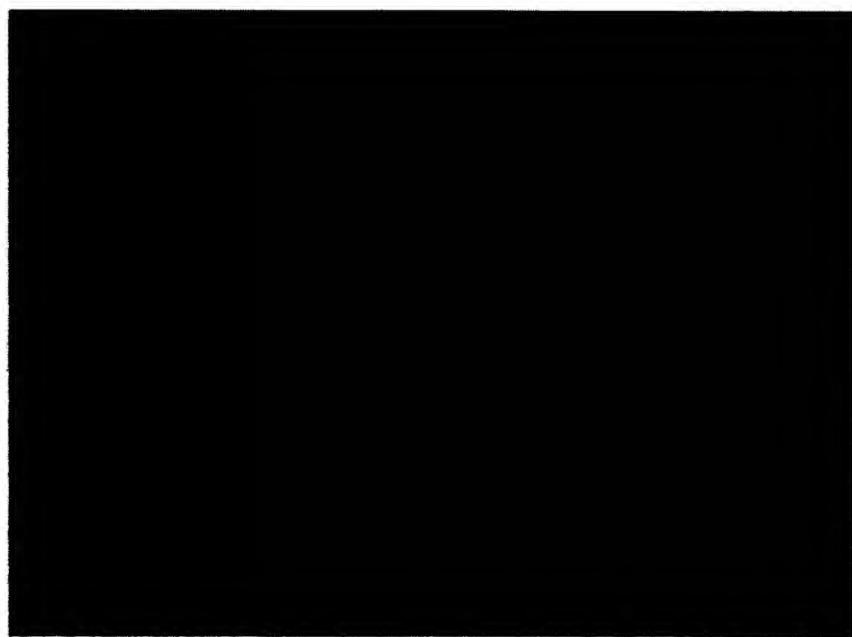


Fig. 26



50KGy

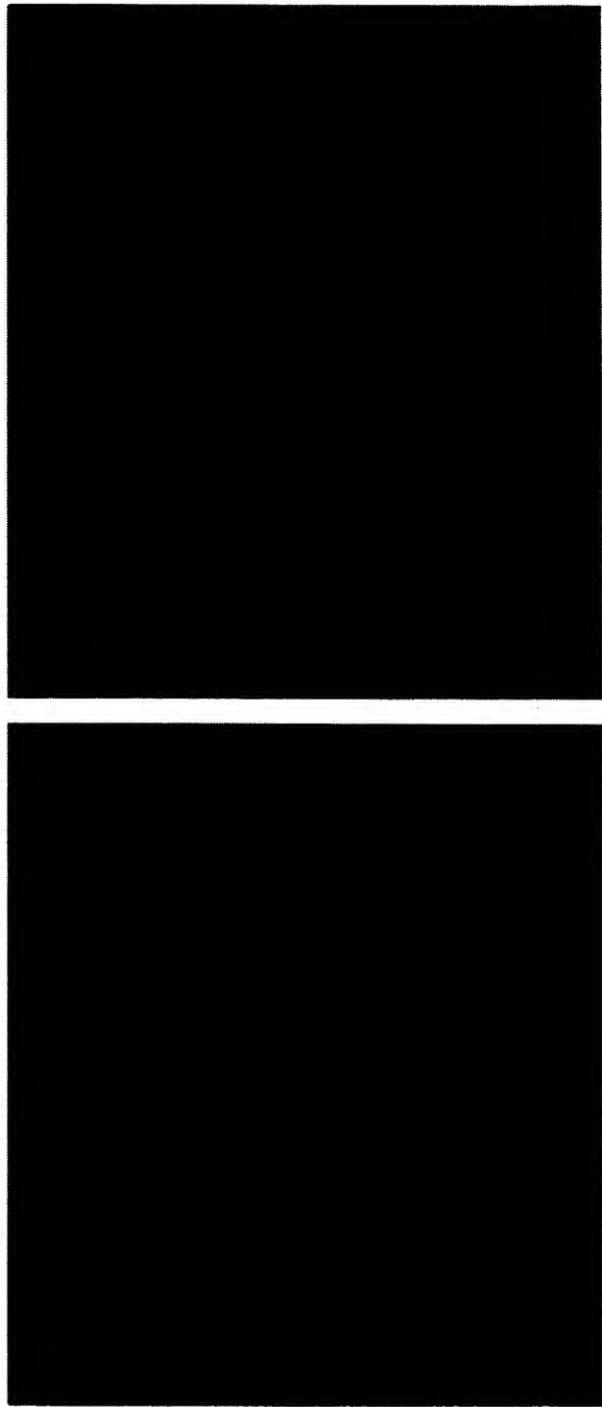
Fig. 27



100KGy

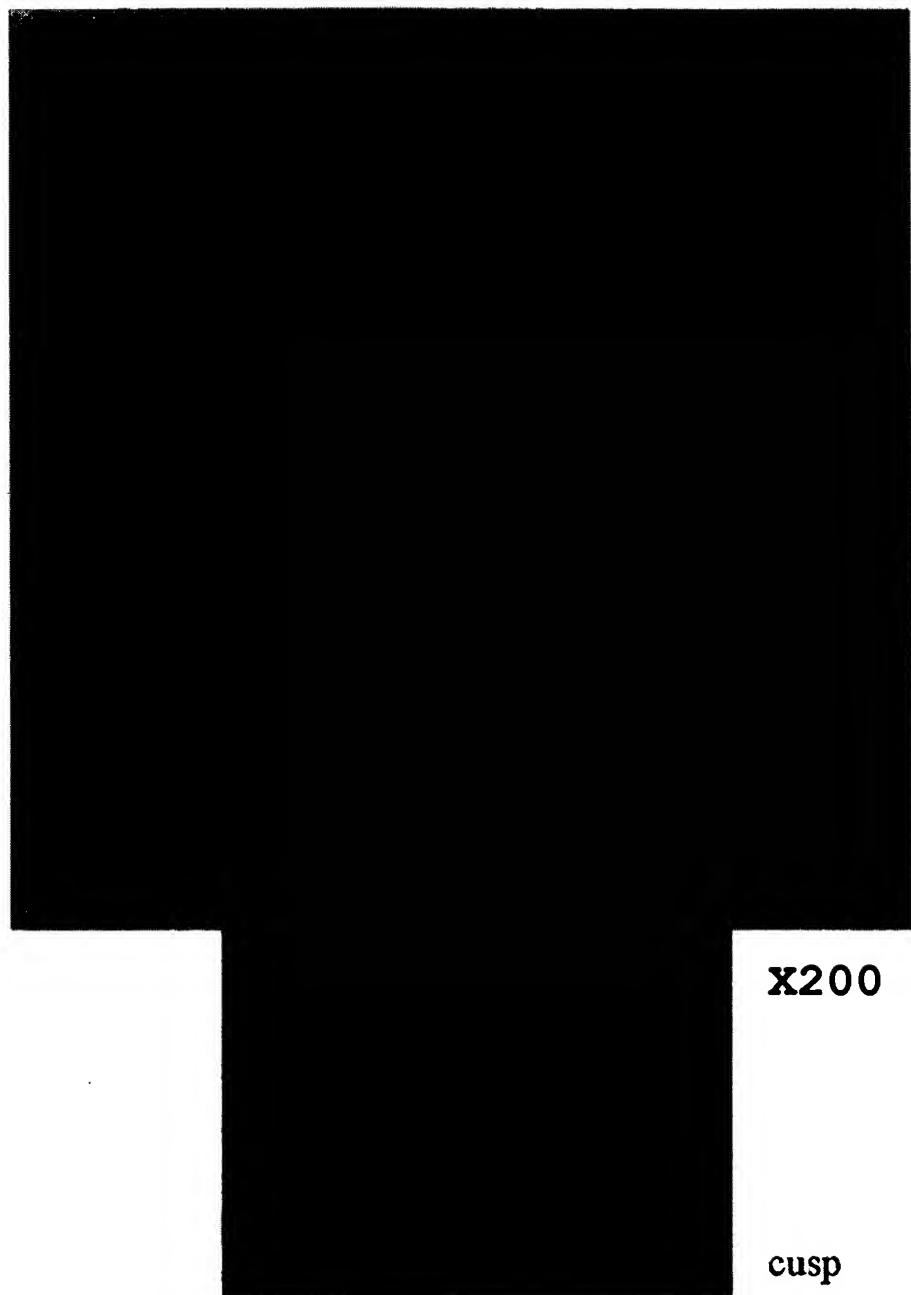
Fig. 28

γ -ray 130KGy + DNase

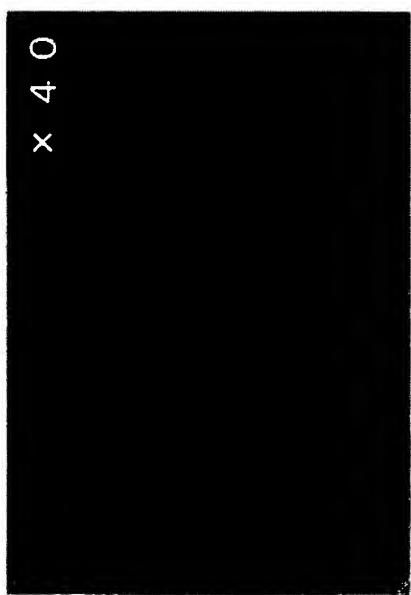


HE staining x200

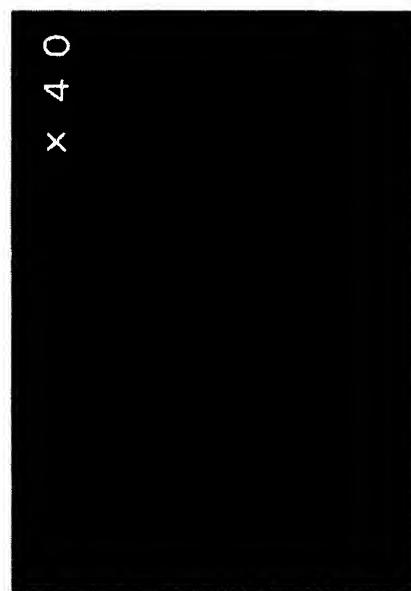
Fig. 29



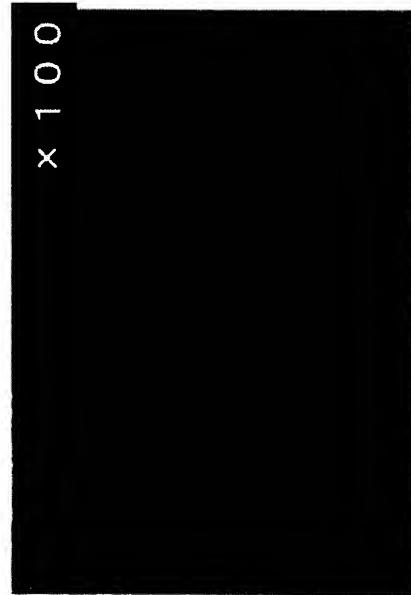
Valve PEG + γ : decellularization effects



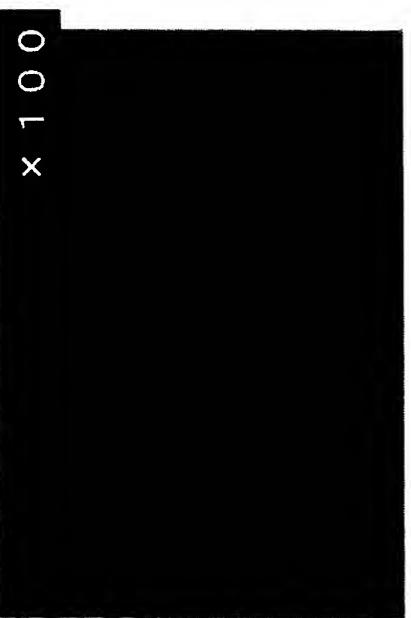
Treatment : PEG + γ -ray 100kGY
Object : valve
Magnification : x40



Treatment : PEG + γ -ray 100kGY
Object : valve
Magnification : x40



Treatment : PEG + γ -ray 100kGY
Object : valve
Magnification : x100

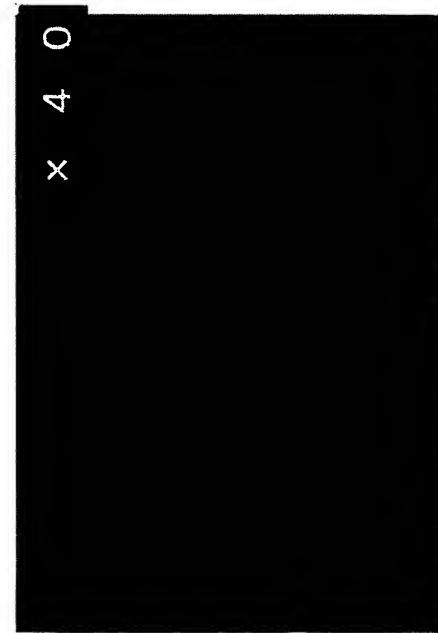


Treatment : PEG + γ -ray 100kGY
Object : valve
Magnification : x100

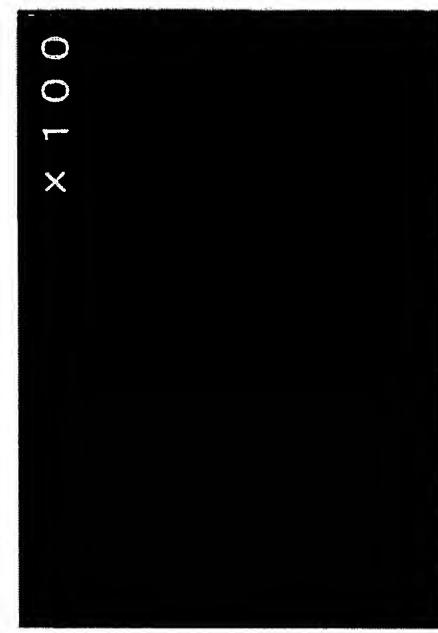
Fig. 30A

Fig. 30B

valve cusp PEG + γ : decellularization effects



Treatment : PEG + γ -ray 100kGy
Object : valve cusp
Magnification : X40



Treatment : PEG + γ -ray 100kGy
Object : valve cusp
Magnification : X100

Fig. 31

PEG Results of tensile strength tests

Testing machine	RTC series			Type of testing	Extension		
Load in full-scale	5 kgf			Rated capacity of load cell	100 N		
Range of load	40 %RO			Rated capacity of the extensometer	20 cm.		
Range of the extensometer	unapplied			Test Speed	10.0 mm/min		
Recording speed off				Rigidity of the testing machine	0 mm/kgf		
Midpoint (load)	0 N	0 0	0 0	Midpoint (extension)	0 cm	50 0	60 0
Analysis of Elastic moduli	Interval	1	50	Initial length	Distance between chunks		
Pitch		1	%max	origin in extension	10 mm		
slack correction	applied			initial load point	0.03 N		
Storing SS curve	ON			Determination of rupture point	0.5 N		

TestID=120	Maximum load	Maximum load	Rupture load	Rupture load	Maximum Extension	Elastic Modulus
	Test No.	kgf	N	kgf	N	MPa
1	1.3522	13.260	1.0889	10.678	18.227	2.3930
2	1.3048	12.797	1.0285	10.068	20.987	1.8916
3	0.9880	9.7870	0.9281	9.1012	14.327	1.8013
4	1.0020	9.8281	0.7277	7.1385	16.367	1.5761
5	0.7638	7.4879	0.7340	7.1981	4.2287	4.7653
Average	1.0841	10.632	0.9010	8.8380	14.427	2.4855
JIS weighted avg	1.2675	12.430	1.0186	9.9888	18.459	3.4698
Median	1.0020	9.8281	0.9281	9.1012	18.227	1.8916
Maximum	1.3522	13.260	1.0889	10.678	20.987	4.7653
SD(n-1)	0.2437	2.3897	0.1656	1.6239	6.2066	1.3090
SD(n)	0.2180	2.1374	0.1481	1.4525	5.5513	1.1708

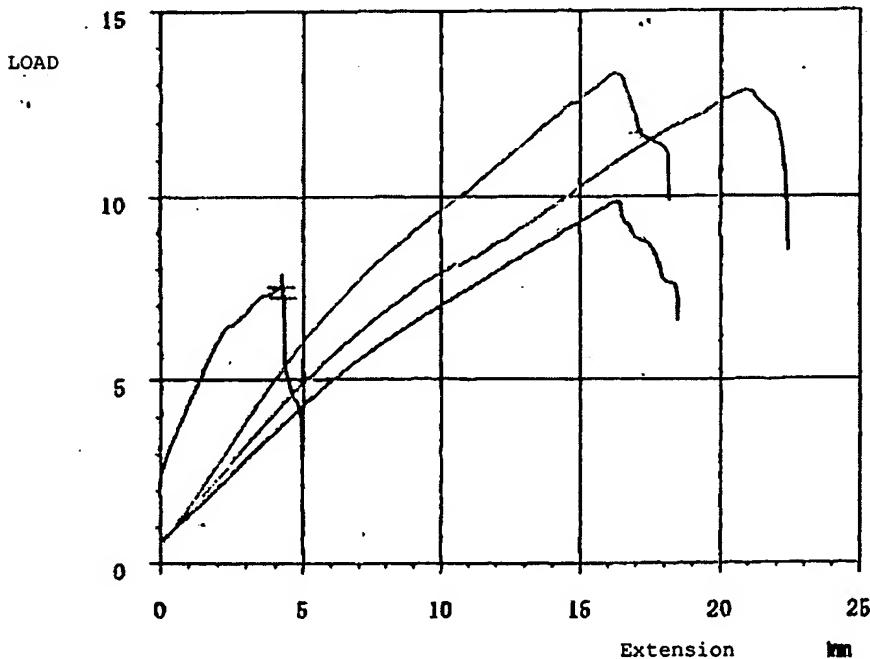


Fig. 32

Results of tensile test of native canine aorta.

Testing machine	RTC series	Type of testing	Extension
Load in full-scale	5 kgf	Rated capacity of load cell	100 N
Range of load	40 %RO	Rated capacity of the extensometer	20 cm
Range of the extensometer	unapplied	Test Speed	10.0 mm/min
Recording speed off		Rigidity of the testing machine	0 mm/kgf
Midpoint (load)	0 N	Midpoint (extension)	0 50 60 0 0 0
Analysis of Elastic moduli	Interval 1 Pitch 1 %max	Initial length origin in extension initial load point	10 mm 0.03 N
slack correction	applied	Determination of rupture point	0.5 N
Storing SS curve	ON		

TestID=37	Maximum load	Maximum load	Rupture load	Rupture load	Maximum Extension	Elastic Modulus
Test No.	kgf	N	kgf	N	mm	MPa
1	0.7591	7.4445	0.5038	4.9404	27.887	1.0918
Average	0.7591	7.4445	0.5038	4.9404	27.887	1.0918
JIS weighted avg	0.7591	7.4445	0.5038	4.9404	27.887	1.0918
Median	0.7591	7.4445	0.5038	4.9404	27.887	1.0918
Maximum	0.7591	7.4445	0.5038	4.9404	27.887	1.0918

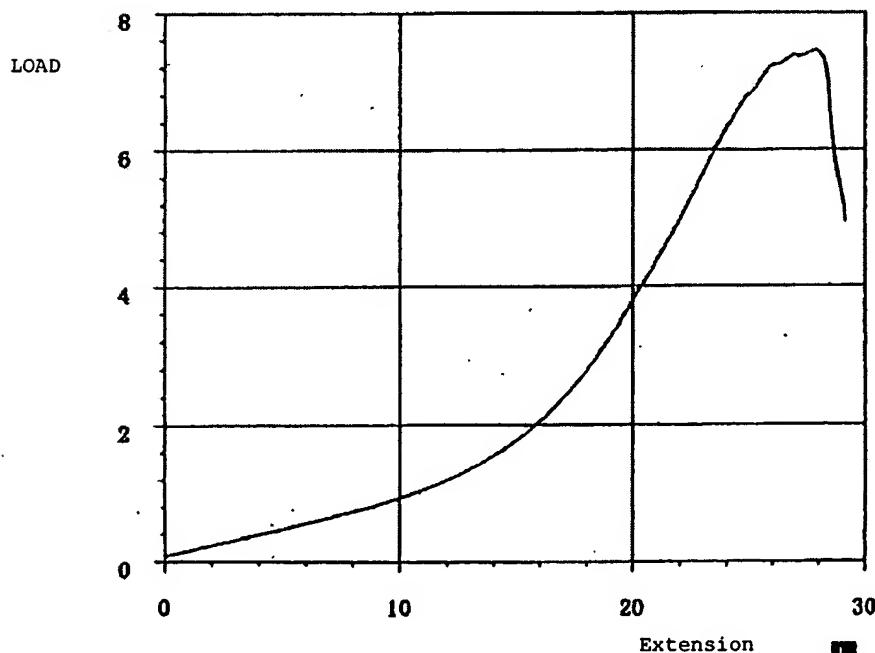


Fig. 33

results of tensile test of conventional artificial valves by means of decellularization cell method by SDS

Testing machine	RTC series	Type of testing	Extension
Load in full-scale	5 kgf	Rated capacity of load cell	100 N
Range of load	40 %RO	Rated capacity of the extensometer	20 cm
Range of the extensometer	unapplied	Test Speed	10.0 mm/min
Recording speed off		Rigidity of the testing machine	0 mm/kgf
Midpoint (load)	0 0 0	Midpoint (extension)	0 50 60
N	0 0 0	cm	0 0 0
Analysis of Elastic moduli slack correction	Interval 1 50 Pitch 1 %max applied	Initial length origin in extension initial load point Distance between chunks Determination of rupture point	10 mm 0.03 N 0.5 N
Storing SS curve	ON		

TestID=17	Maximum load	Maximum load	Rupture load	Rupture load	Elastic Modulus
Test No.	kgf	N	kgf	N	MPa
1	1.0401	10.200	1.0284	10.085	2.5168
2	0.7085	6.9574	0.6856	6.7231	1.4581
3	0.7142	7.0038	0.6339	6.2164	1.4976
4	0.8572	8.4063	0.8503	8.3987	1.6630
5	0.6693	6.5639	0.6613	6.4847	1.1928
Average	0.7981	7.8263	0.7719	7.5686	1.6653
JIS weighted avg.	0.9198	9.0180	0.9040	8.8849	2.0527
Median	0.7142	7.0038	0.6856	6.7231	1.4976
Maximum	1.0401	10.200	1.0284	10.085	2.5168
SD(n-1)	0.1529	1.4996	0.1863	1.8313	0.6050
SD(n)	0.1368	1.3413	0.1488	1.4591	0.4517

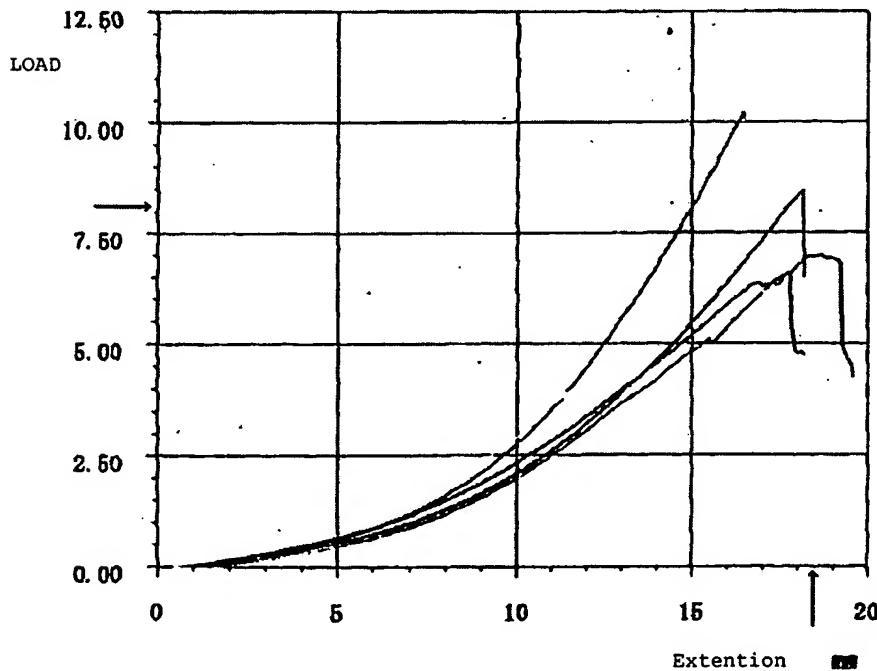


Fig. 34

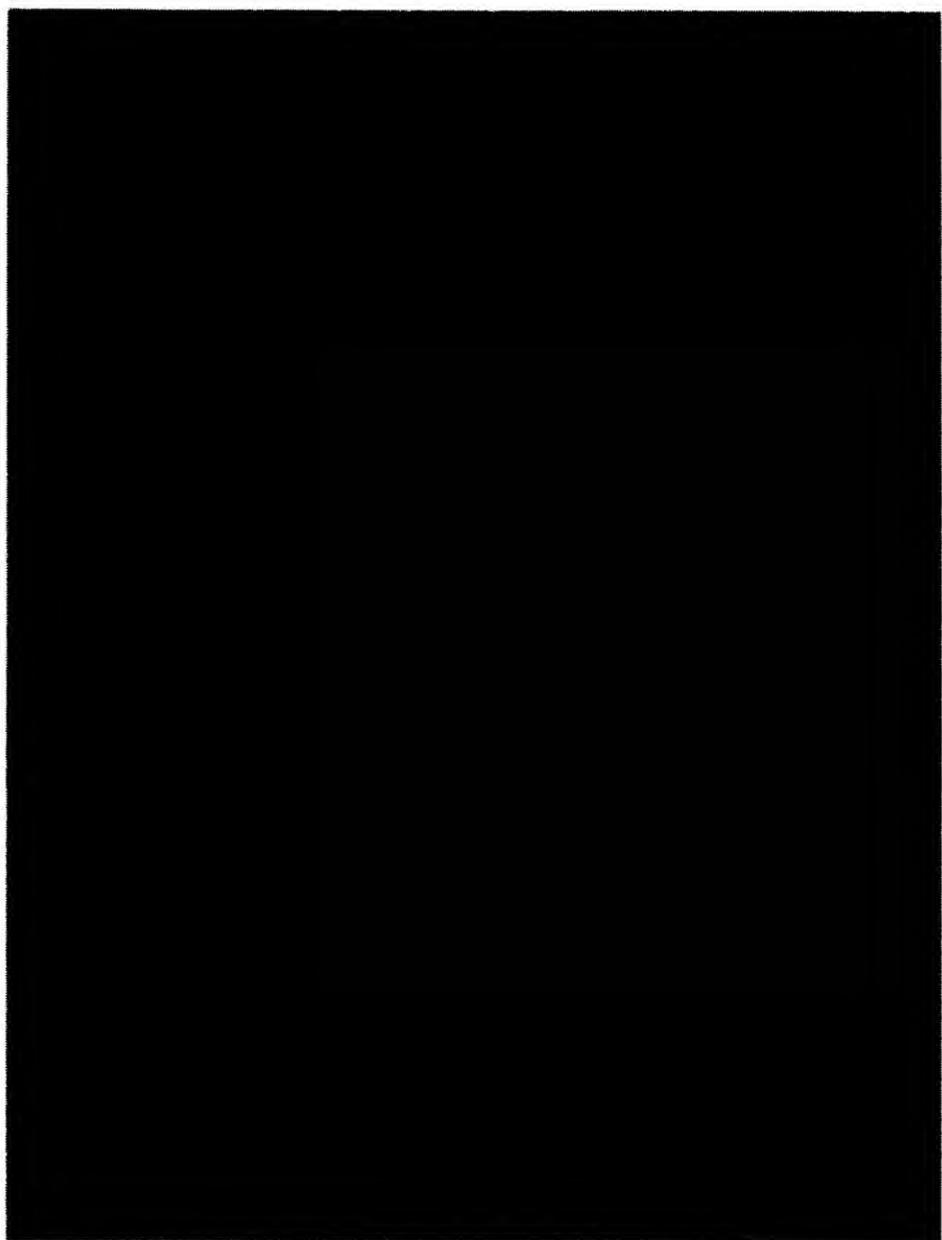
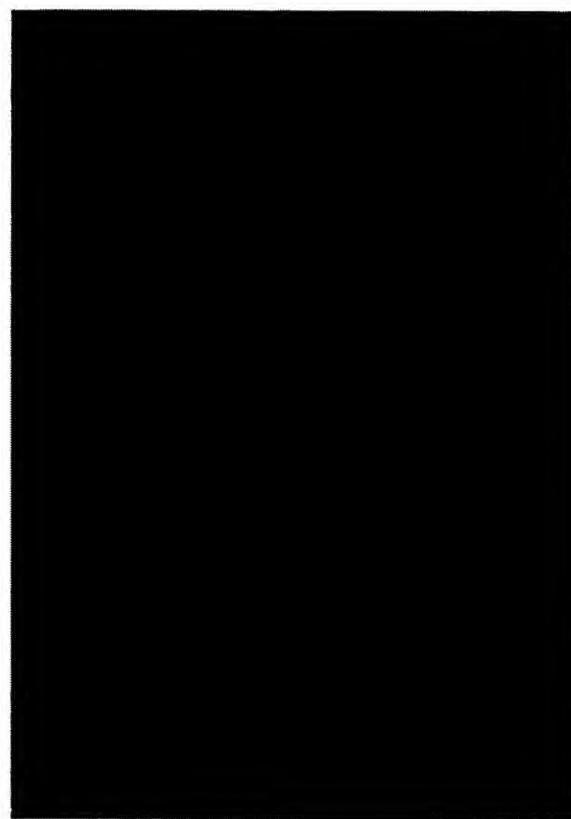


Fig. 35

×200



×100

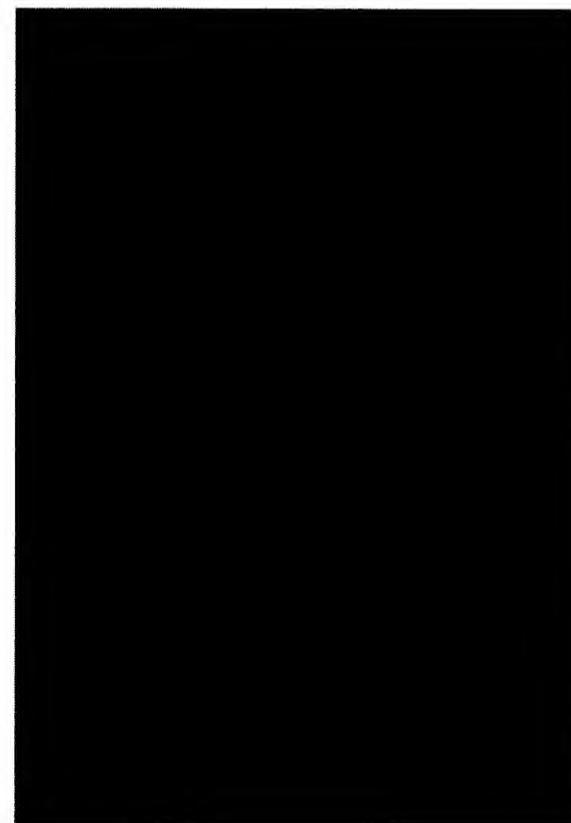
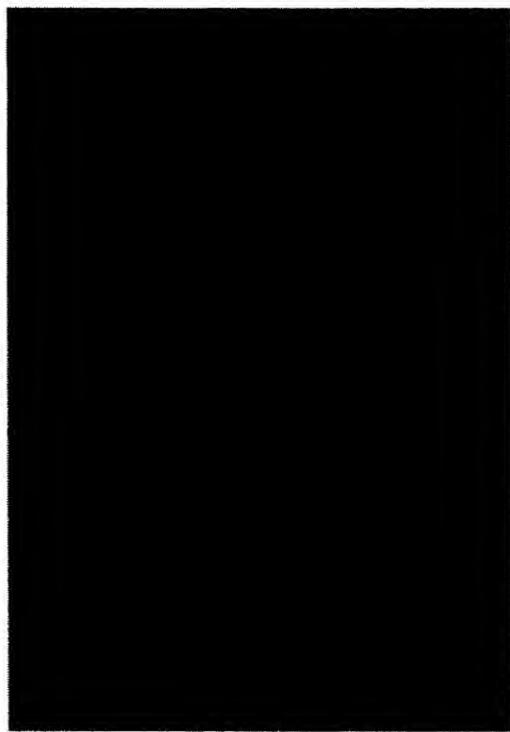


Fig. 36



$\times 100$



$\times 40$

Fig. 37

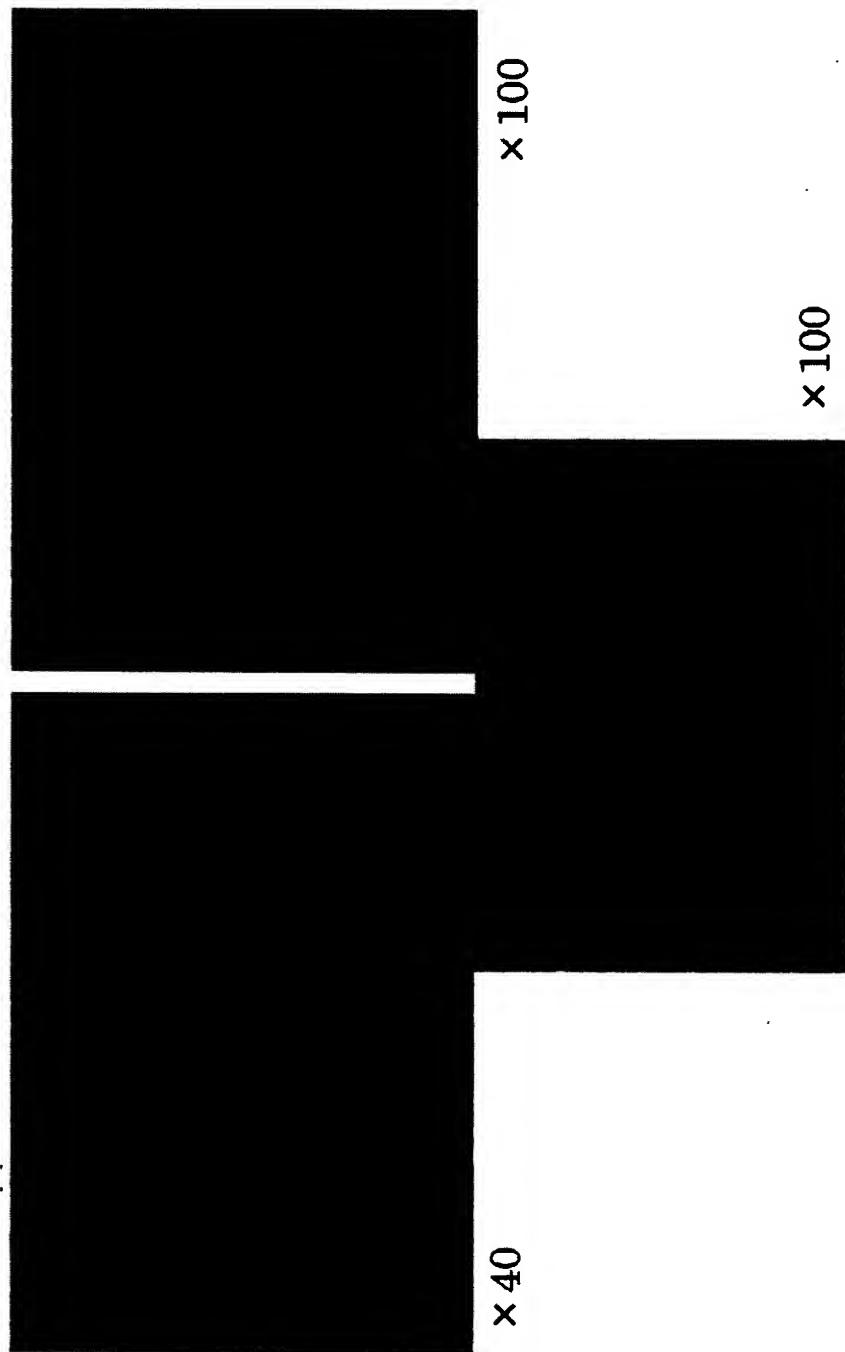


Fig. 38

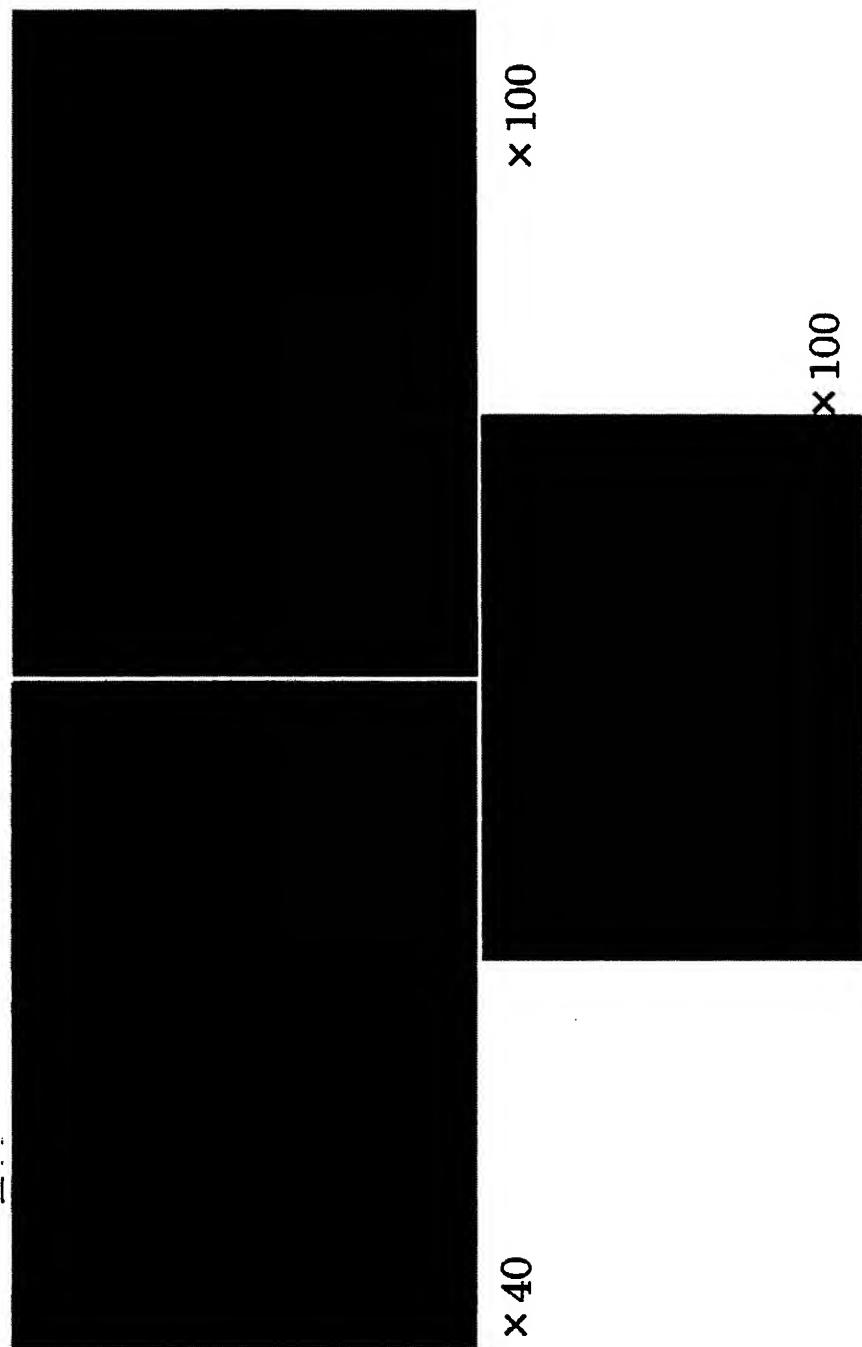


Fig. 39

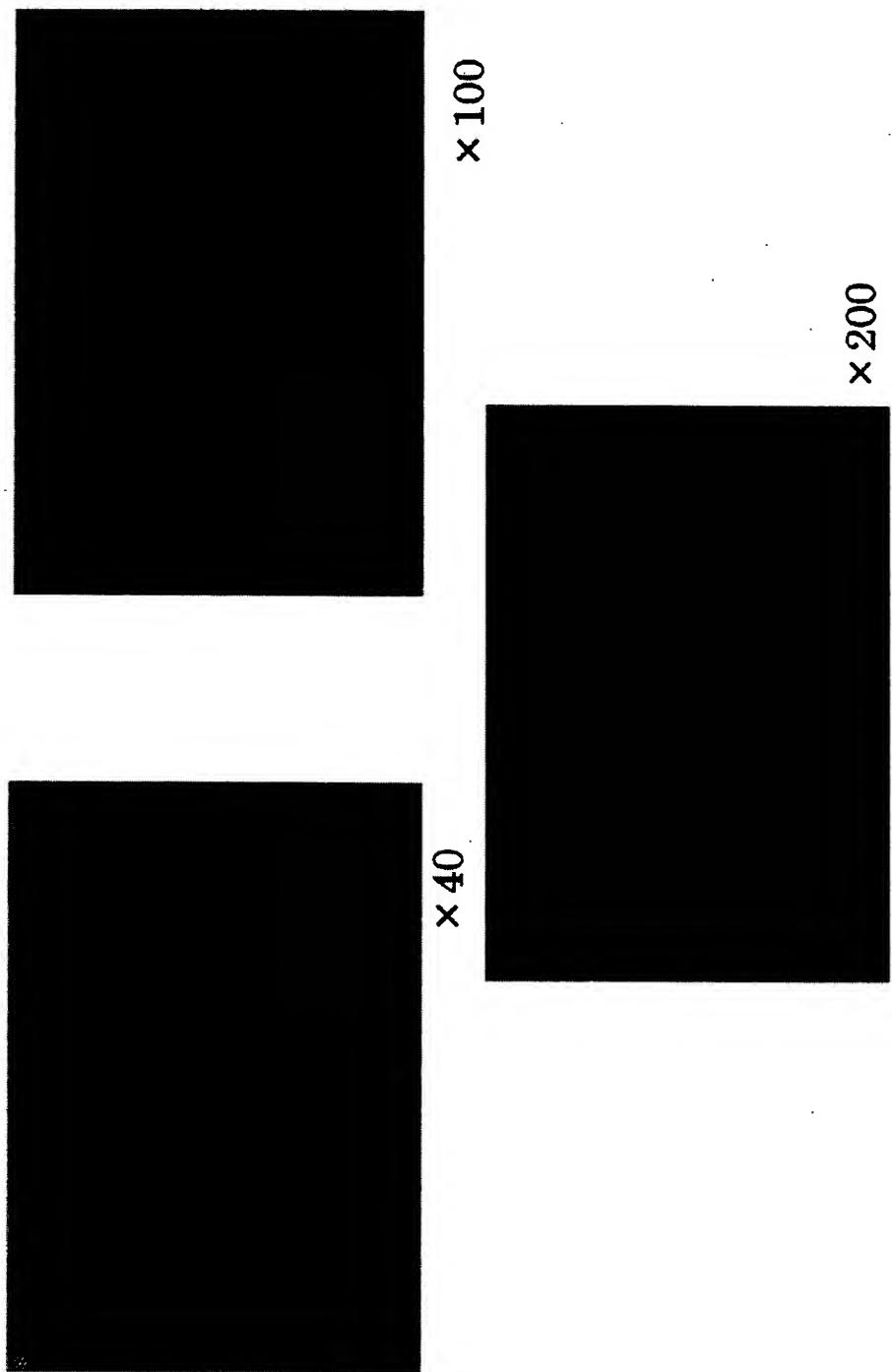
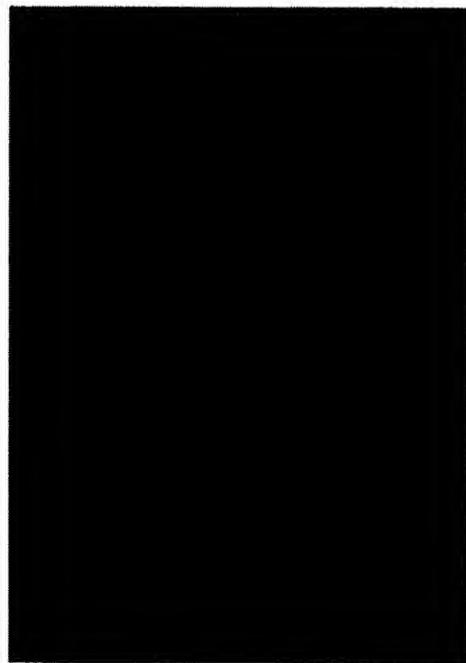
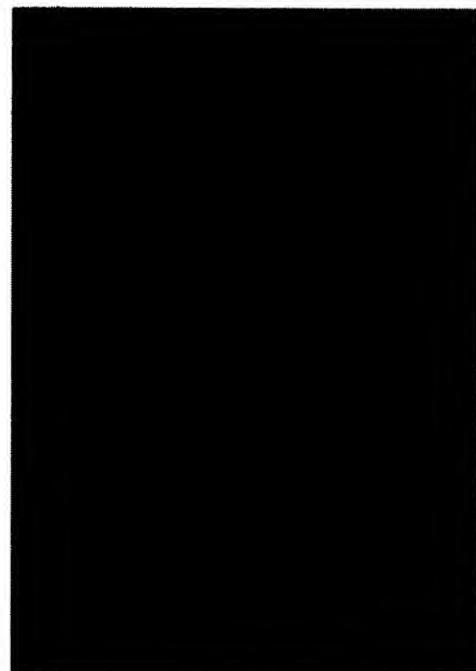


Fig. 40



× 100



× 40

Fig. 41

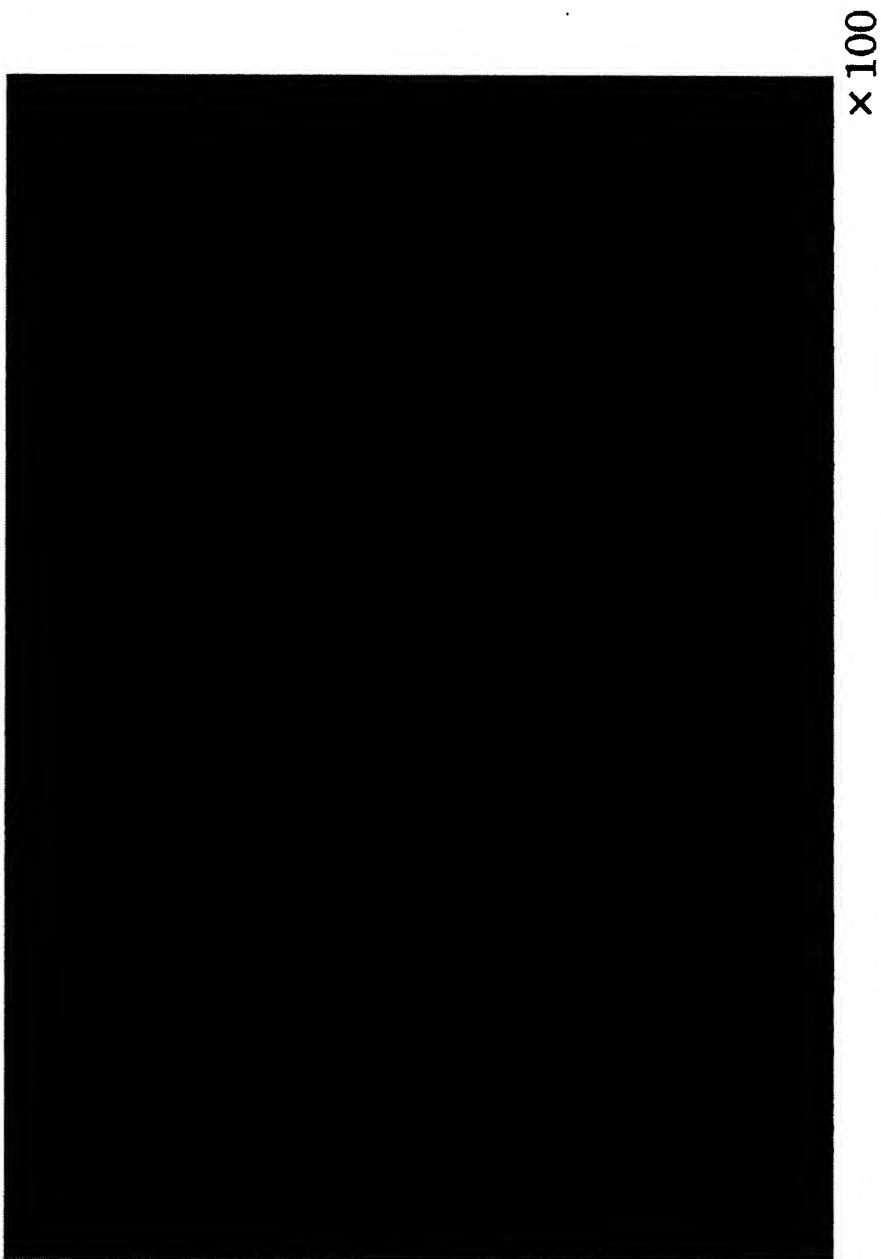
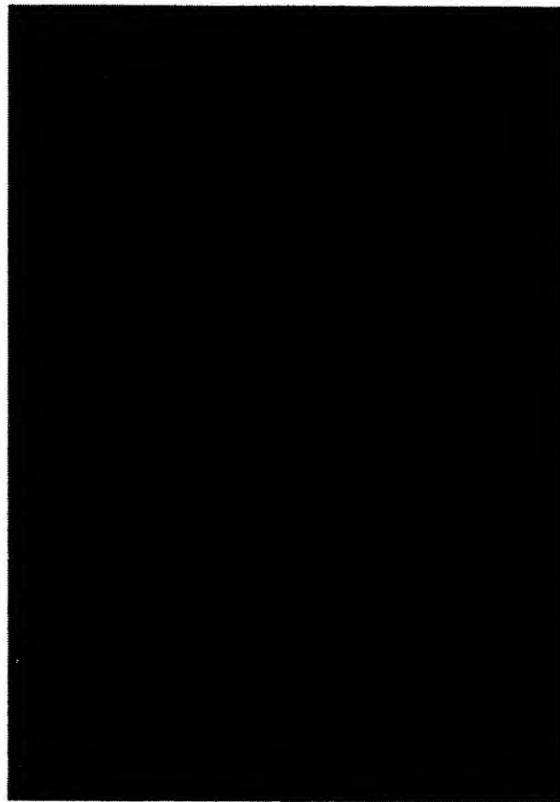
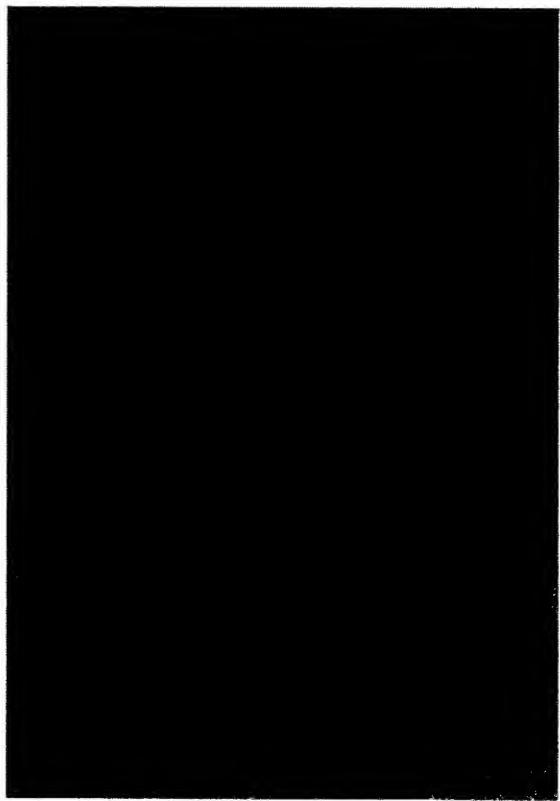


Fig. 42



× 100



× 40

Fig. 43

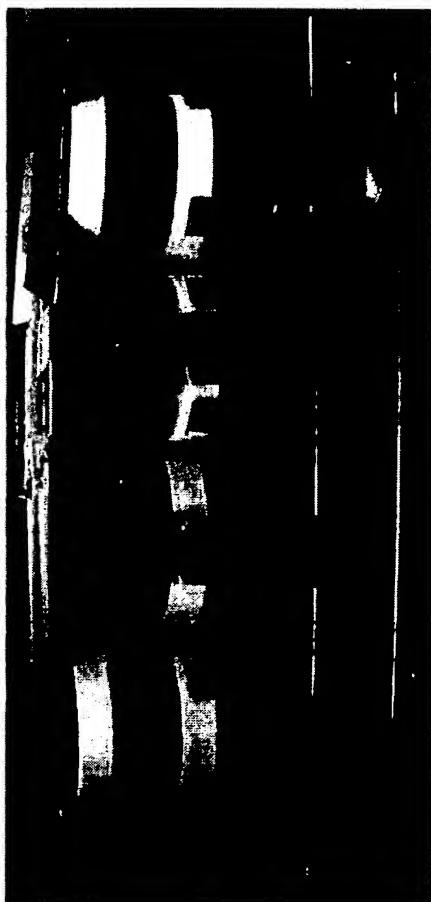


Fig. 44

* HE staining, X200, gamma-irradiation: 15kGy			
native			No remaining cells
remaining cells observed			No remaining cells
			No remaining cells

Fig. 45A

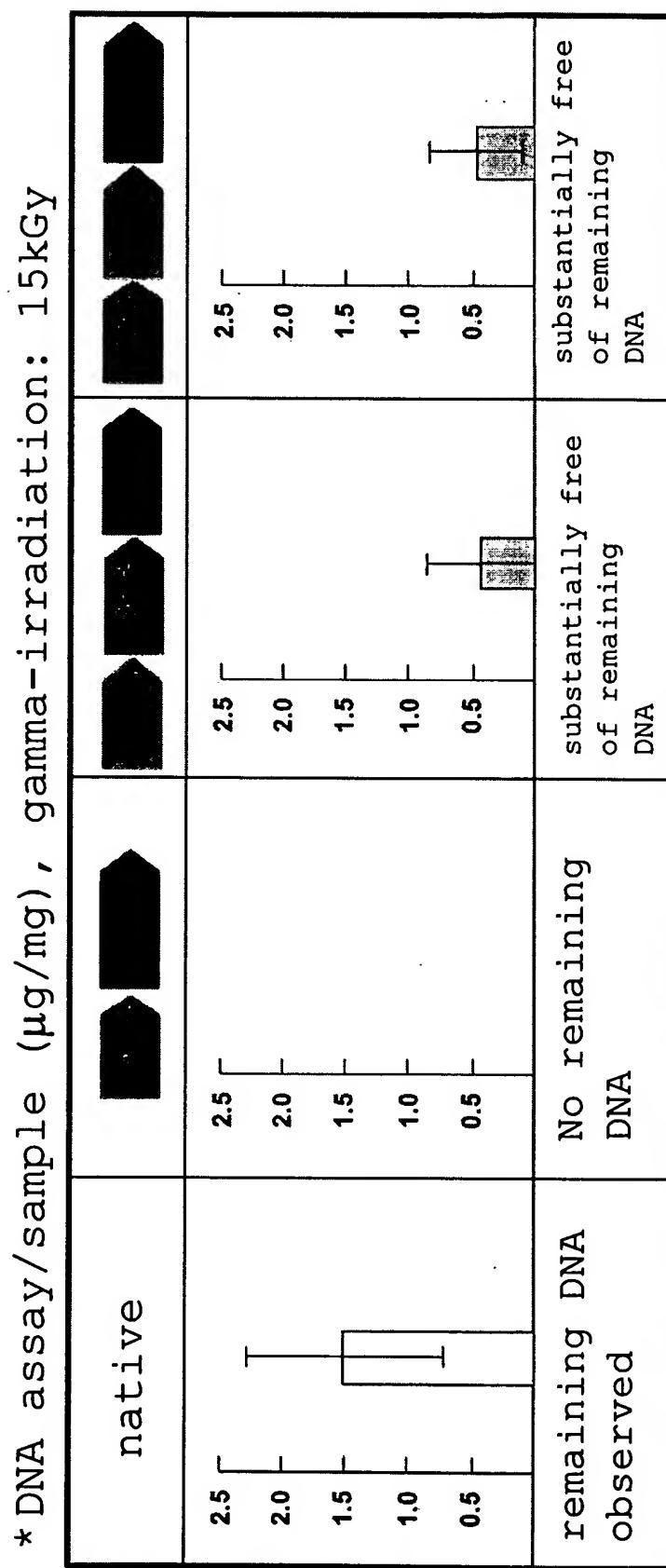


Fig. 45B

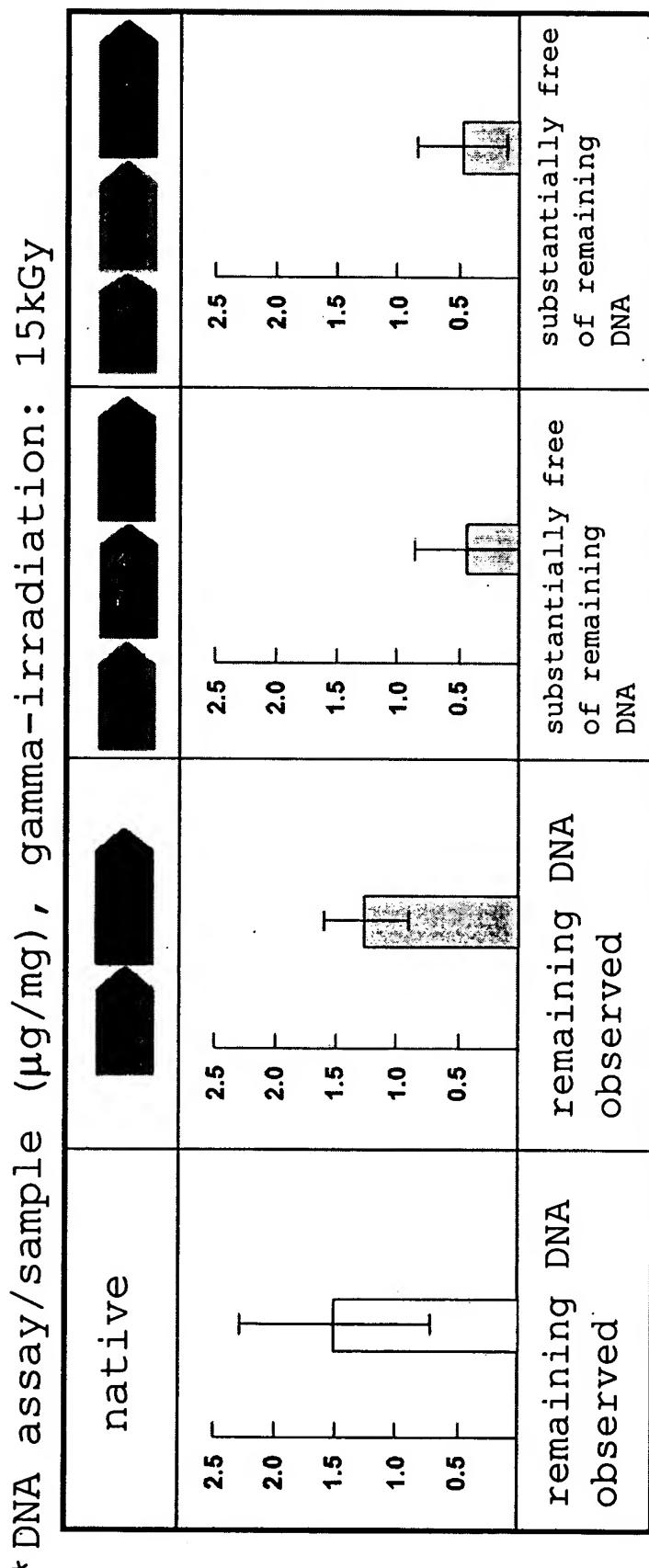


Fig. 46

* protein assay/sample (mg/mg), gamma-irradiation: 15kGy

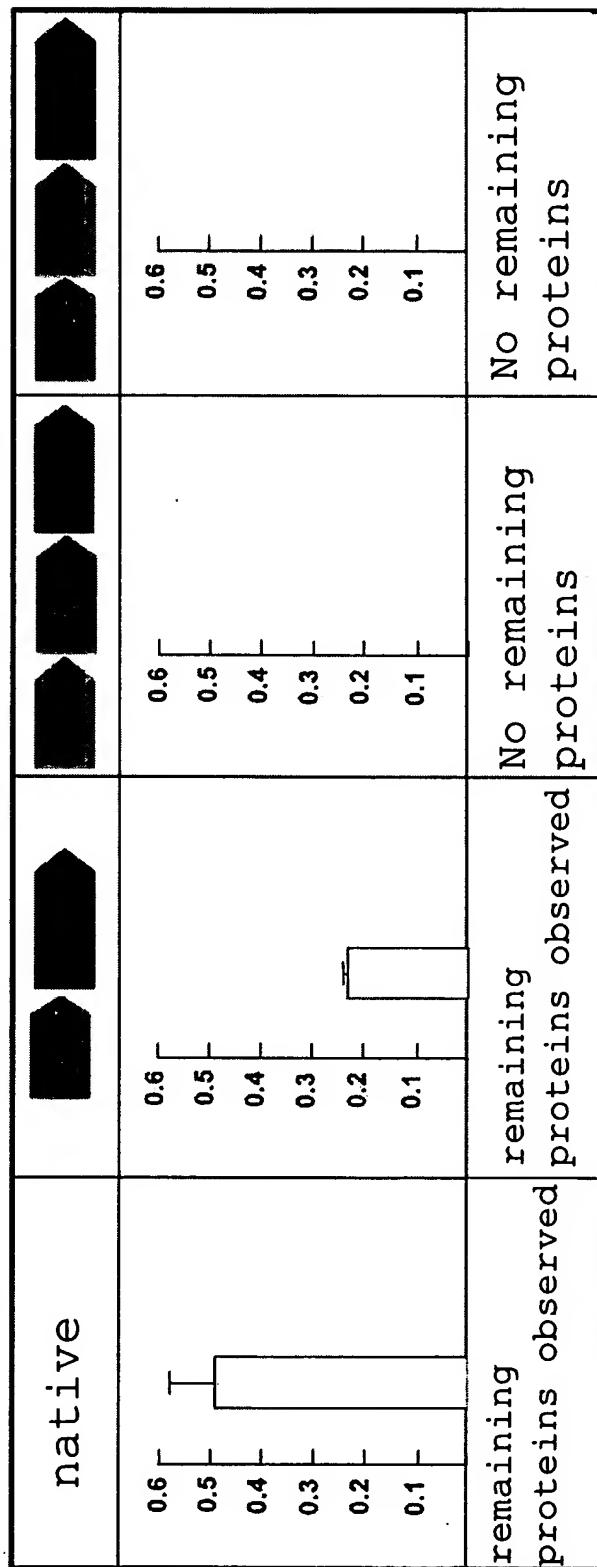


Fig. 47

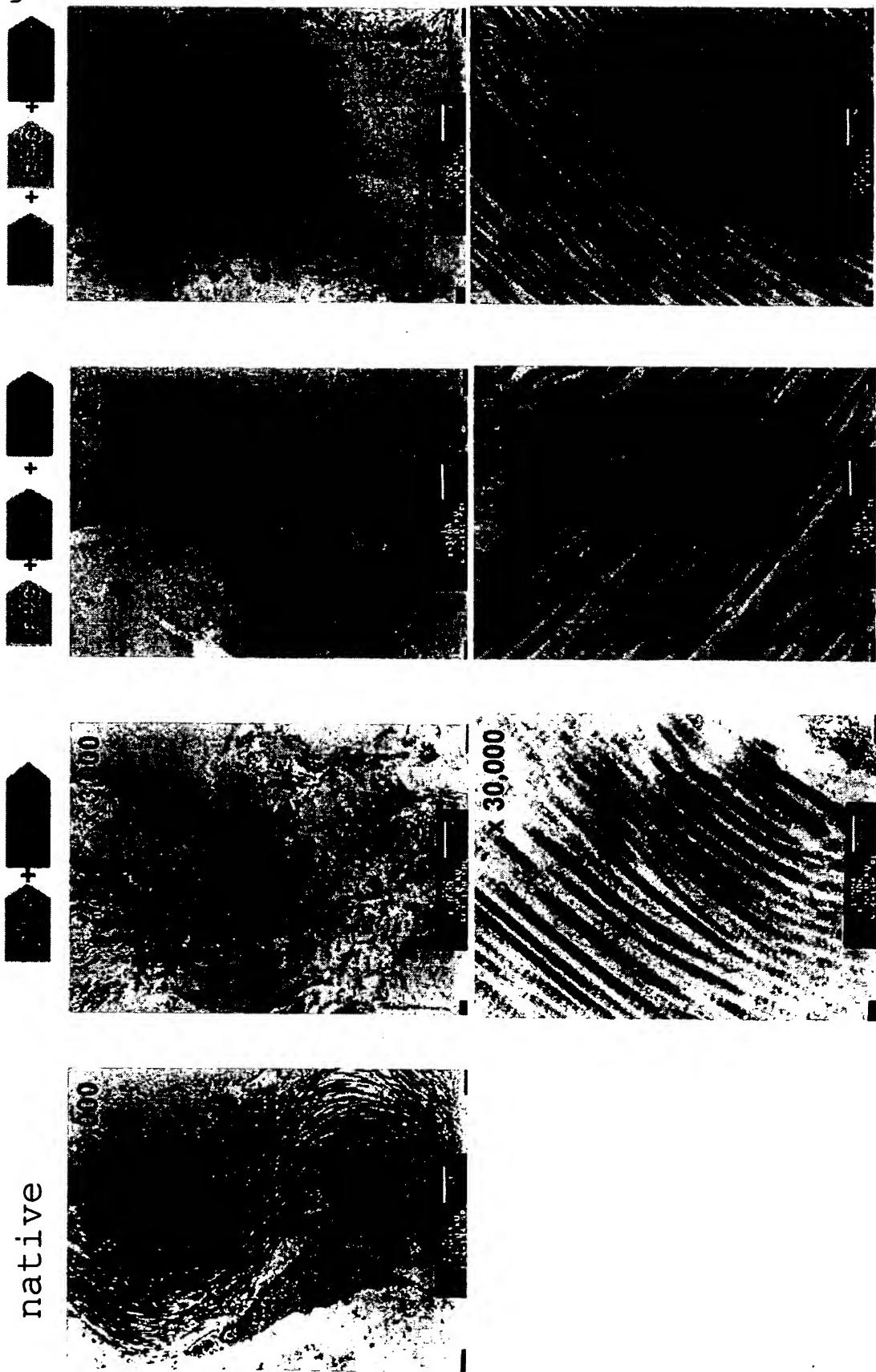


Fig. 48

*Tensile strength test/maximum load (N), gamma-irradiation: 151GY

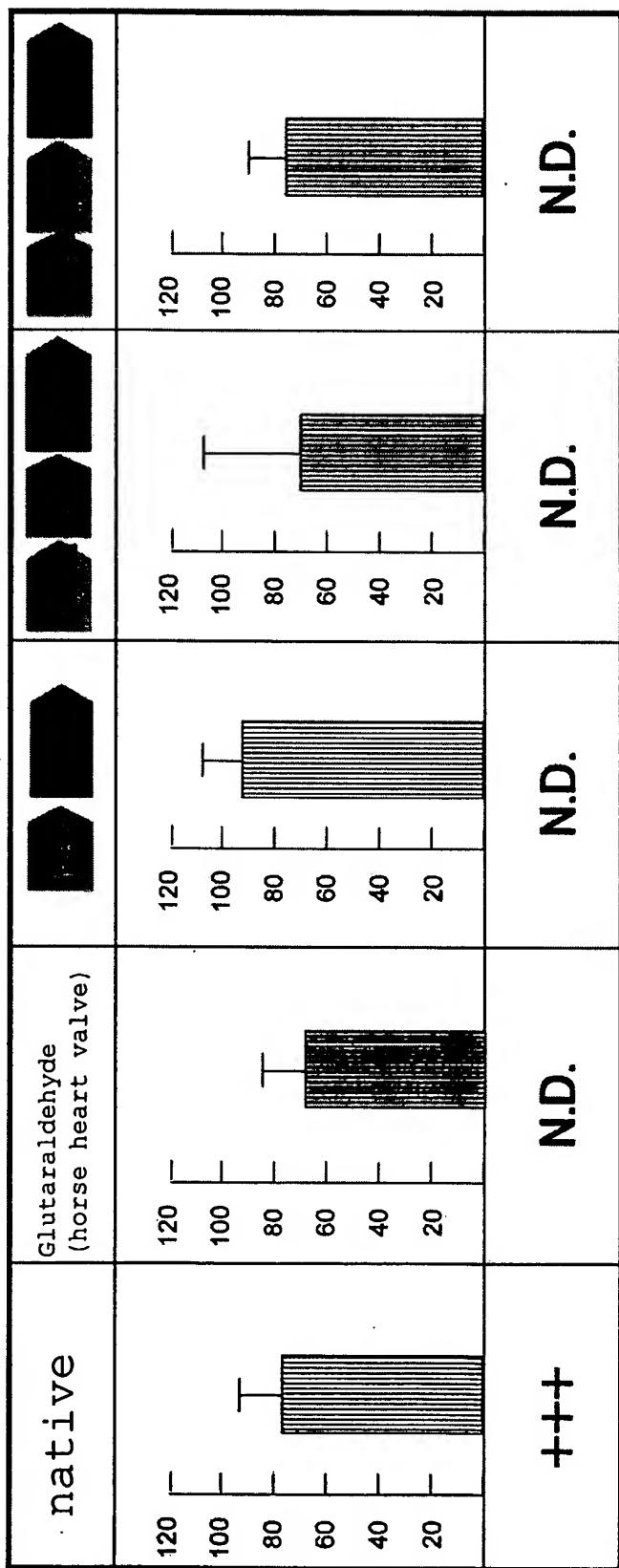


Fig. 49

* HE staining, one week after transplantation, gamma-irradiation:15kGy	
native	Glutaraldehyde (horse heart valve)
	
Immunological rejection reaction observed	Immunological rejection reaction observed
	No immunological rejection reaction

Fig. 50

* HE staining, two months after transplantation, gamma-irradiation: 15kGY

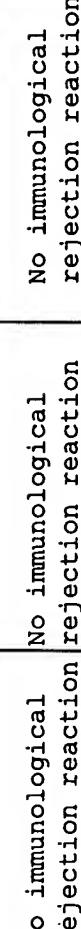
native	Glutaraldehyde (horse heart valve)			
				
Immunological rejection reaction observed	Immunological rejection reaction observed	No immunological rejection reaction	No immunological rejection reaction	No immunological rejection reaction

Fig. 51

* von Kossa staining , two months after transplantation, gamma-irradiation:15kGy

native	Glutaraldehyde (horse heart valve)			
No calcification reaction	Calcification reaction observed	No calcification reaction	No calcification reaction	No calcification reaction

Fig. 52

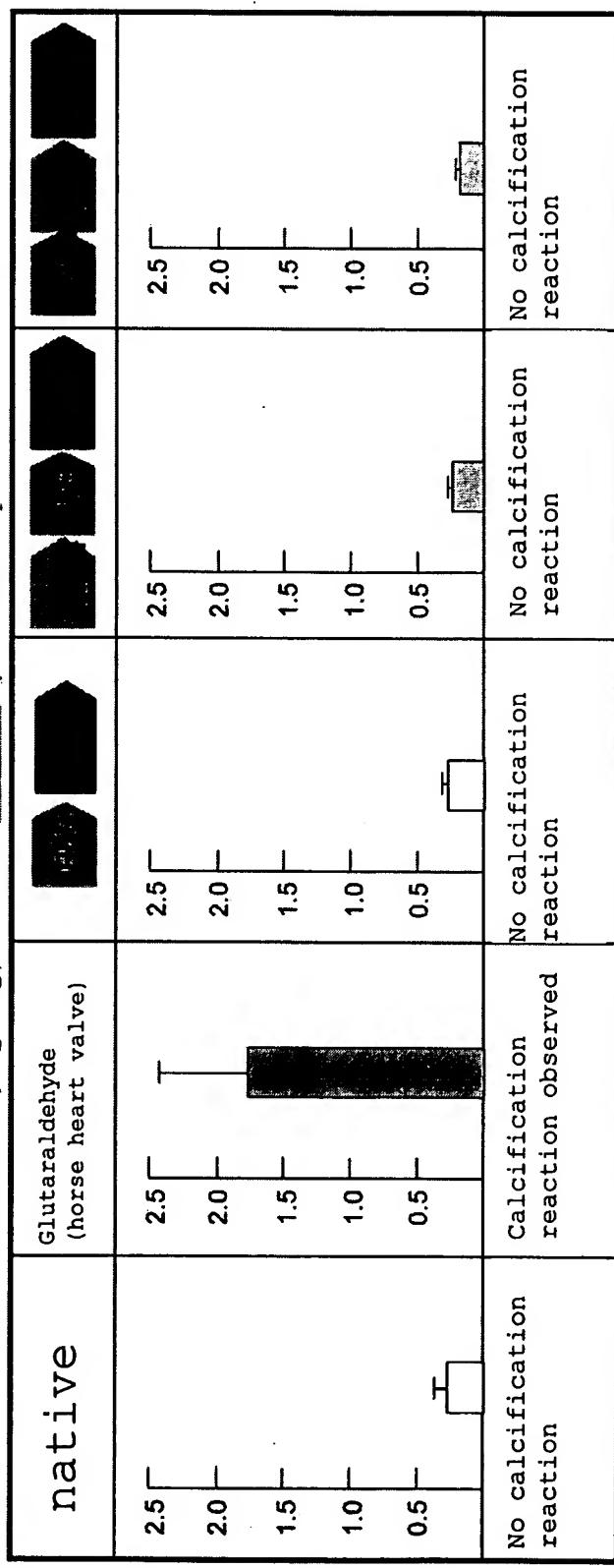
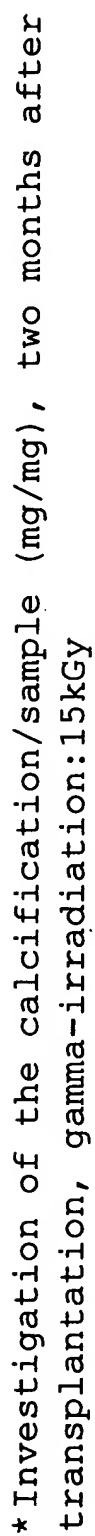


Fig. 53

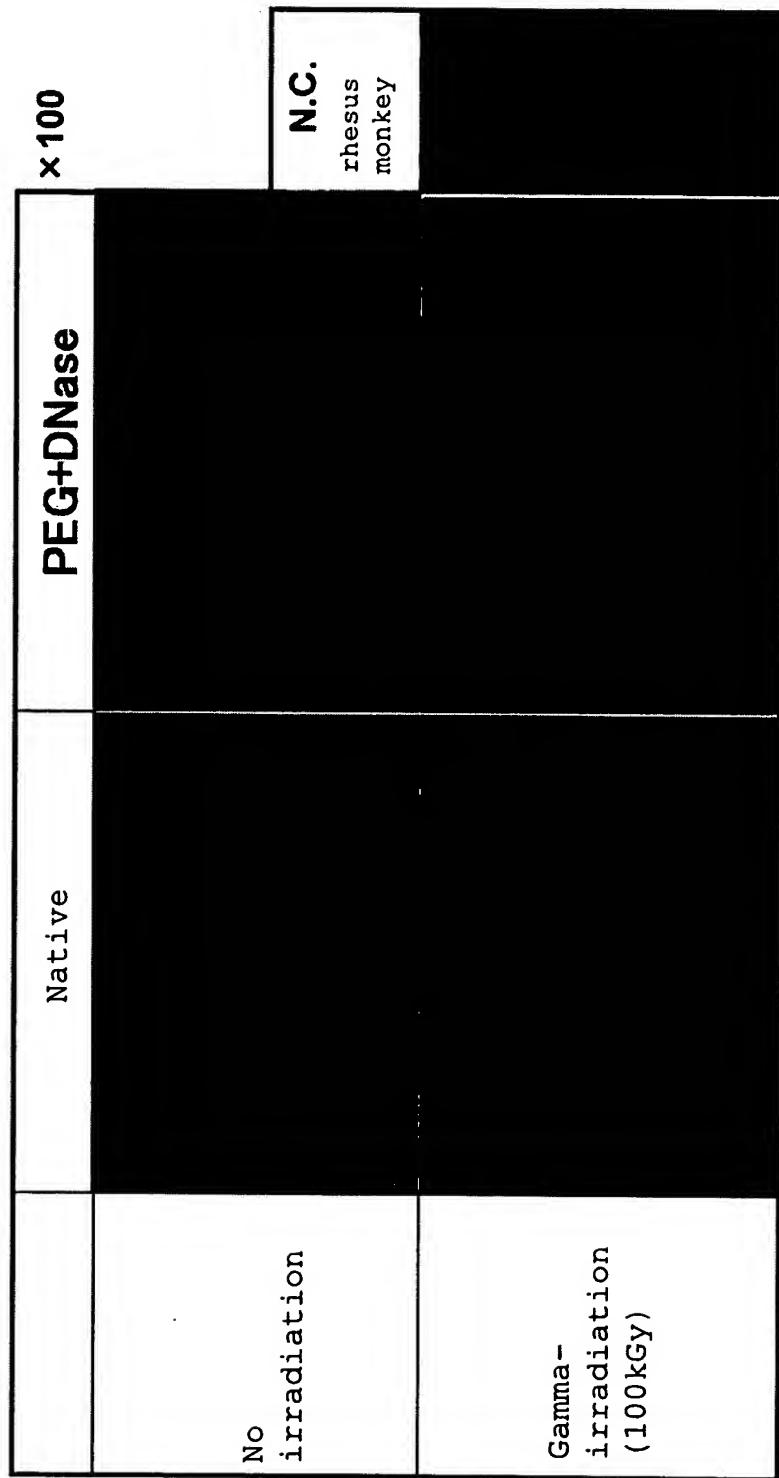


Fig. 54

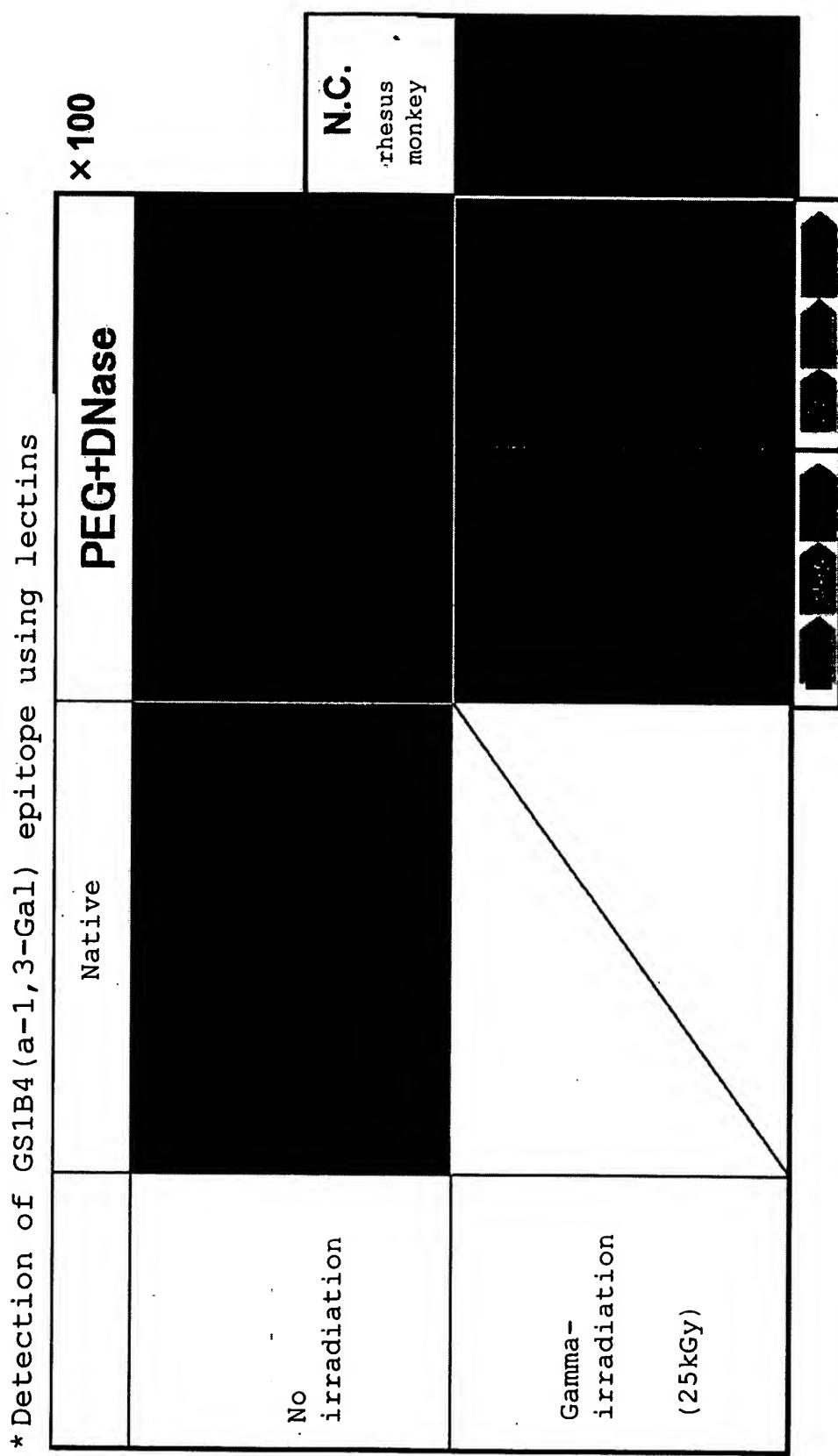
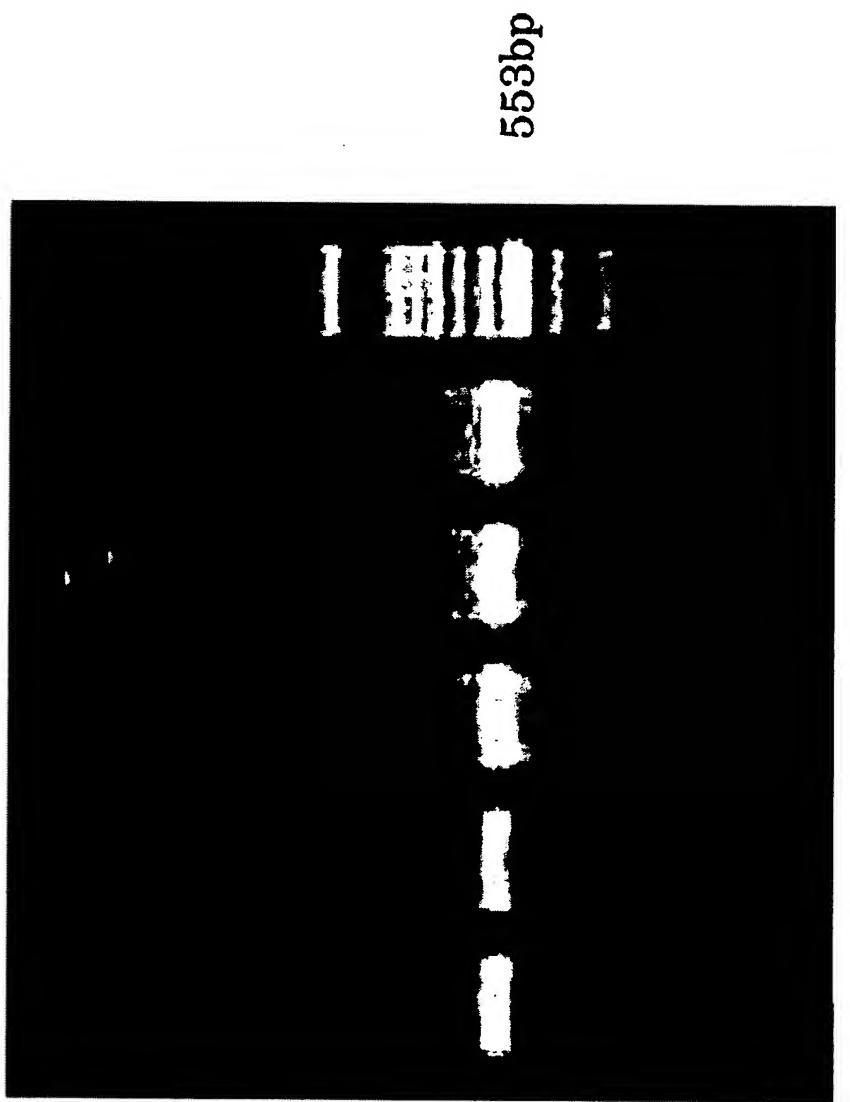


Fig. 55



(1) native porcine valve (n=5)

Fig. 56

553bp

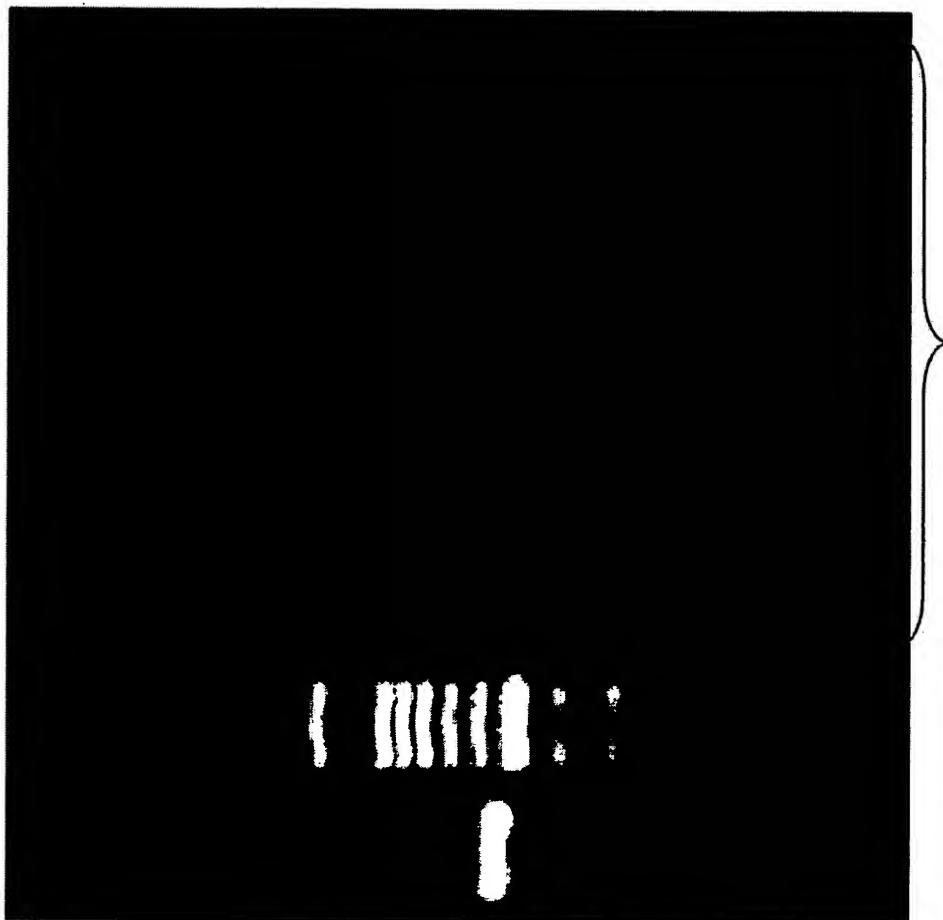
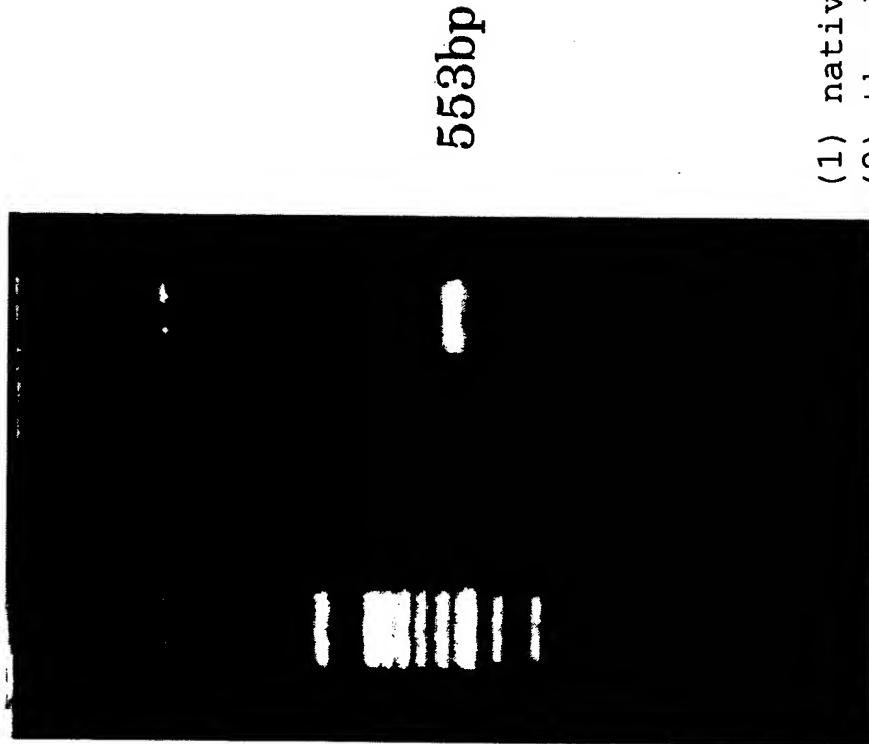


Fig. 57



- (1) native porcine valves
- (2) the decellularized porcine valves removed from the host thirty days after transplantation
- (3) the decellularized porcine valves removed from the fifty-six days after transplantation

Marker (3) (4) (1)

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